USDA

United States
Department of
Agriculture

Forest Service

ENVIRONMENTAL ASSESSMENT

LOS ALAMOS NATIONAL LABORATORY PALEOSEISMIC RESEARCH PROPOSAL

SPECIAL USE PERMIT

Project Number: 51678

Española Ranger District

Santa Fe National Forest

Santa Fe County, New Mexico

Region 3
Santa Fe National Forest

Permit Applicant – National Nuclear Security Administration: Los Alamos National Laboratory

February 2018

UNITED STATES DEPARTMENT OF AGRICULTURE

Forest Service

Southwestern Region

Santa Fe National Forest

Española Ranger District

Santa Fe County, New Mexico

Los Alamos National Laboratory –Special Use Permit/

Environmental Assessment

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SECTION 1: PURPOSE AND NEED FOR ACTION

Introduction

The United States Department of Agriculture (USDA) Forest Service's (USFS) Española Ranger District (District) within the Santa Fe National Forest (SFNF) is reviewing an application for a special use permit to conduct a geologic investigation submitted by the Department of Energy (DOE) on behalf of Los Alamos National Laboratory (LANL or Laboratory), titled *DOE/LANL Paleoseismic Trenching Project* (Trenching Project). The regional setting is shown in Figure 1. The project would entail excavating trenches across segments of the Pajarito Fault System on sites located within Forest System lands west of Highway 501 in Los Alamos County, New Mexico, between Pajarito Canyon, Cañon de Valle, and Water Canyon. The proposed trench locations are in the same local area where geologic investigations of a similar nature were conducted in the summer of 1998 (LANL 2016).

LANL is a multidisciplinary, multipurpose research institution owned and managed by the DOE, National Nuclear Security Administration[1] (NNSA), Los Alamos Field Office, in north-central New Mexico. Per DOE orders and standards, DOE obligates its facilities to understand their seismic hazard, calculated ground motion from a seismic event, and facilities' positions relative to known faults (DOE 2016). Therefore, LANL evaluates and updates probabilistic seismic hazard analyses[2] for existing and planned facilities as necessary to meet DOE facility design criteria identified in DOE Standard 1020 (DOE 2016).

LANL's mission and its geologic setting requires reexamination and recalculation of its probabilistic seismic hazard every ten years. The foundation of seismic hazard calculation is the acquisition of field data to reduce uncertainties in the probabilistic analyses. LANL is located adjacent to and within the Espanola Basin of the Rio Grande rift in northern New Mexico. The active western margin of the rift near LANL and Los Alamos is the Pajarito fault system. LANL's first seismic hazard analysis was published in 1995; an update was published in 2007 following the acquisition of additional field geologic data, including information from past paleoseismic trenching efforts.

Previous geologic trenching investigations along segments of the Pajarito fault system were conducted more than 15 years ago and the existing data have high uncertainty in terms of their ability to identify and constrain individual Holocene earthquakes (LANL 2016). The geologic techniques and tools used in the 1990's for geologic age dating on the Pajarito fault system paleoseismic trenches have advanced significantly in the last 15 years. Conducting new trenching investigations using updated techniques would better constrain the number, timing, and magnitude of Holocene paleoearthquakes on the Pajarito fault system, thus reducing uncertainties in LANL's current hazard calculations.

[1] The National Nuclear Security Administration is a semiautonomous agency within DOE.

[2] Probabilistic seismic hazard analysis (PSHA) is a methodology that estimates the likelihood that various levels of earthquake-caused ground motions will be exceeded at a given location in a given future time period. The results of such an analysis are expressed as estimated probabilities per year or estimated annual frequencies.

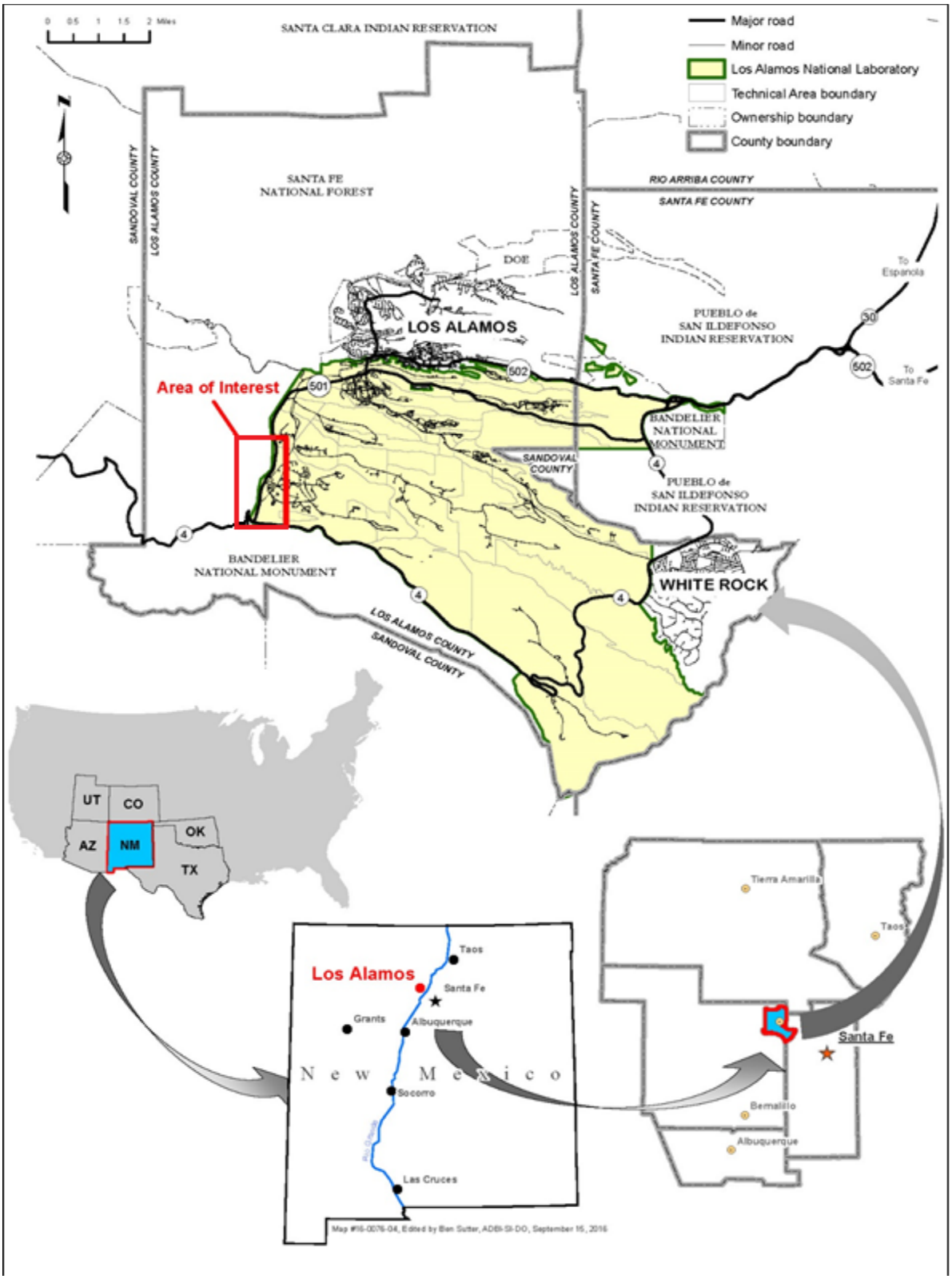

Figure 1. Regional Setting and General Location of the Trenching Sites in Relationship to Surrounding Land Ownership.

Consultation with the U.S. Fish and Wildlife Service Fish and Wildlife (USFWS), in compliance with the Endangered Species Act, was initiated because the proposed Trenching Project is within the critical habitat of the federally listed threatened Mexican Spotted Owl (*Strix occidentalis lucida*) and the endangered Jemez Mountains Salamander (*Plethodon neomexicanus*) and has been completed. Subsequently, the USFWS issued a Biological Opinion (BO) (see Appendix 1) that specifies several conservation measures. The BA made a determination of a potential "take" of Jemez Mountain Salamanders. Due to the take determination, the District directed that an Environmental Assessment (EA) be prepared (36 CFR 220).

Accordingly, this EA was prepared in compliance with the National Environmental Policy Act of 1969 (NEPA), as amended (42 United States Code 4321 et seq.). NEPA requires federal agencies to consider the environmental consequences of their proposed actions before making decisions. In complying with NEPA, the USFS follows the Council on Environmental Quality regulations (40 CFR 1500–1508) and USFS NEPA-implementing procedures (36 CFR 220). This EA provides the USFS with sufficient evidence and analysis to determine whether to issue a finding of no significant impact for the issuance of a special use permit, deny the special use permit, or direct the preparation of an environmental impact statement.

Proposed Action

The Española Ranger District, SFNF is considering the following actions that would be authorized should the special use permit be issued:

Project Location: The proposed Trenching Project locations are on SFNF lands west of Highway 501 in Los Alamos County, between Pajarito Canyon, Cañon de Valle, and Water Canyon. Trenches would be excavated on two specific sites on USFS lands, known as Site 98-4 and Site B (see Section 2, Figure 2).

Starting Date and Access Routes: The proposed starting date is approximately Spring/Summer 2018 for field work and heavy equipment excavation (e.g., backhoe, trackhoe). Access routes will be initiated from West Jemez Road (NM Highway 501) to the trench site locations at this same time. Project personnel access to each site would be primarily on foot.

Purpose and Need

The DOE's purpose and need in applying for the special use permit is to authorize the excavation of paleoseismic trenches on USFS land to more clearly understand and quantity the seismic risk assumed by LANL operations and to develop defensible positions on seismic design basis for LANL facility engineering and safety.

Decision Framework

Based on the analysis contained in this EA, the Española District Ranger will decide whether to issue a special use permit, deny the special use permit, or require the preparation of an environmental impact statement for the proposed trenching and access roads associated with DOE/LANL Paleoseismic Trenching Project.

Role of the Forest Plan

The 1987 Santa Fe Forest Plan, as amended, set the goals and objectives for the management of the SFNF. Goals describe the desired resource conditions for the future and are the basis for project-level planning. The standards, guidelines, and management direction contained in the 1987 Forest Plan set parameters with

which the project must take place. Approval of any management activity must be consistent with these parameters (16 U.S.C. 160(i)). The Forest Plan can be found on the SFNF website at: http://www.fs.fed.us/r3/sfe/projects/plansReports/index.html. (USDA 1987)

The Proposed Action is within Management Area C that contains transportation corridors and areas which provide essential habitat for threatened and endangered species along with opportunities for developed recreation and viewing scenery. Management emphasis for these areas is on enhancement of visual quality and developed recreation opportunities while protecting essential wildlife habitat and riparian zones. New proposals in federally threatened and endangered species habitat require a biological assessment and consultation with Fish and Wildlife Service regarding those species.

The planning principles in the 36 CFR 219.1 regulations were integrated in the July 1987 Forest Management Plan for the SFNF. The plan integrates all 14 principles as stated in the Introduction on page 1. Principle 1 states: "Establishment of goals and objectives for multiple use and sustained yield management of renewable resources without impairment of the productivity of the land". Principle 3 states: "Recognition that the National Forests are ecosystems and their management for goods and services requires an awareness and consideration of the interrelationships among plants, animals, soil, water, air, and other environmental factors within such ecosystems." Principle 7 states: "Provisions for the safe use and enjoyment of the forest resources by the public." Principle 14 states "Responsiveness to changing conditions of land and other resources and to changing social and economic demands of the American people." (USDA 1987)

The Proposed Action is consistent with the principles described above; however, an environmental assessment was prepared due to the potential adverse effects to the Jemez Mountains salamander that were identified in the Biological Assessment.

Public Involvement

The Proposed Action for permitting the *DOE/LANL Paleoseismic Trenching Project* was listed in the Schedule of Proposed Actions (SOPA) on July 19, 2017. The SOPA is available to the public on the USFS website, located at https://www.fs.usda.gov/project/?project=51678. A description of the Proposed Action was listed on the USFS public NEPA website with a copy of the scoping letter that was sent out on July 20, 2017. The scoping period was from July 20 to August 25, 2017.

No comments were received from the public. This Preliminary EA was available for a 30 day scoping period from February 16 to March 18. After this public review, the Final EA and decision documents, including any public comments, will be posted on the SOPA and SFNF websites.

Issues

There are two identified issues.

1. ***Threatened and Endangered Species:*** The USFWS issued a biological opinion that determined that the Trenching Project is not likely to jeopardize the continued existence of the Jemez Mountains Salamander and is not likely to destroy or adversely modify designated critical habitat. Incidental take of Jemez Mountains salamanders is reasonably certain to occur as a result of implementation of the proposed action. This determination was based on the conservation measures already incorporated in the project description. However, the USFWS stipulated that the project

incorporate specific mitigations and the monitoring of impacts of the Proposed Action on the Jemez Mountains salamander and its critical habitat and submit an annual monitoring report within 90 days of the completed Proposed Action or at the end of year 2017. An annual report was submitted and accepted by the USFWS on November 20, 2017. An additional report would be submitted by LANL either at the conclusion of the project or end of year 2018 (LANL 2017).

2. ***Recreation:*** Perimeter Trail 190 would be directly affected (Figure 2) during access of heavy equipment to Site 98-4, egress of heavy equipment at the conclusion of the project, and during re-contouring and reseeding of trail areas scarred by heavy equipment transport, if any. The trail would remain open to hiker and mountain biker use except for brief periods of time during trail modifications necessary for heavy equipment trenching site access, vehicle passage to Site 98-4, and re-contouring and revegetation post project. Temporary closures could affect approximately 0.34 miles (1,795 ft.) of Perimeter Trail 190. Trail users may detour cross country around the equipment during these times, wait for the equipment to pass, or detour from the trail by returning to the highway. The trenching sites comprise approximately 6 acres which would be posted and fenced off while the trenches are open.

Tribal Consultation

In addition to the public scoping, potentially affected tribal governments were notified about the proposed project on July 14, 2017 with comments requested by August 18, 2017. Tribal governments that were sent letters were Kewa Pueblo, Ohkay Owingeh Pueblo, Pueblo de Cochiti, Pueblo de San Ildefonso, Pueblo of Jemez, Pueblo of Nambé, Pueblo of Tesuque and Santa Clara Pueblo. The second round of tribal letters were sent with the Environmental Assessment for comment on February 12, 2018. One comment letter was received from the Santa Clara Pueblo on March 12, 2018 with concern on potential subsurface artifacts and specific vegetation. Mitigations were adjusted accordingly in the proposed action.

SECTION 2: FORMULATION OF ALTERNATIVES

Alternative Summary

This section describes the alternatives that have been considered in the development of this EA.

Alternative A is the Proposed Action which consists of:

- Issuance of a Special Issue Permit for the *DOE/LANL Paleoseismic Trenching Project.*

Alternative B is the No Action alternative where:

- A special use permit for the *DOE/LANL Paleoseismic Trenching Project* would not be issued.

No other alternatives were identified to address unresolved conflicts concerning alternative uses of available resources.

Alternative A – THE PROPOSED ACTION

The Española Ranger District, SFNF is considering the following actions that would be authorized should the special use permit be issued:

Trenches would be excavated on two specific sites on USFS lands, known as Site 98-4 and Site B (Figure 2). The land use in these areas is recreational (LANL 2016). The only paved roads in the immediate vicinity are New Mexico Highway 501 and New Mexico State Route 4 (LANL 2016).

Tracked[3] heavy equipment (e.g., backhoe or trackhoe) access routes would be from West Jemez Road (NM Highway 501) to the trench site locations (Figure 2). Personnel access to each site would be primarily on foot. The access routes would not require construction of standard roads, but would require some ground disturbance for the trenching equipment access. Road improvements will not incorporate base course, gravel, or pavement and will be maintained as natural as possible. The temporary access paths may require the clearing of low brush and removing of small scrub oak; moving existing fallen trees and logs; and improvements, at Site 98-4 only, involving earthwork over limited sections.

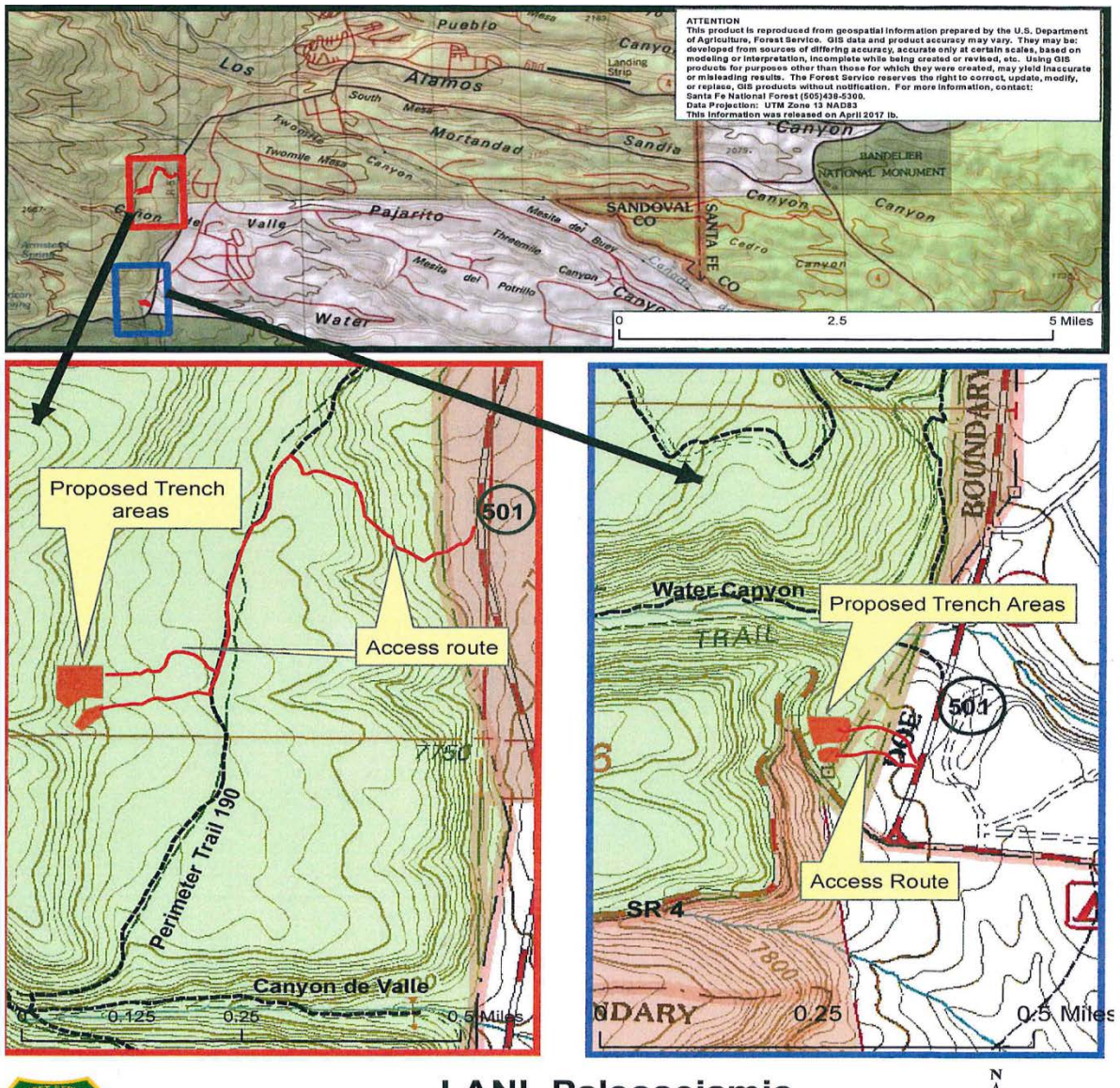

Figure 2. ***Top Frame:*** **Trenching Site Locations,** ***Left Bottom Frame:*** **Site 98-4,** ***Right Bottom Frame:*** **Site B.**

Pedestrian and biking access to Perimeter Trail 190 will be controlled during trail improvements and when heavy vehicles are in transit to the trenching sites. Recreational users could detour country around the equipment, wait for the equipment to pass, or return to the highway to bypass the affected segment of Perimeter Trail 190. About 0.34 miles (1,795 ft.) of the route would utilize the Perimeter Trail 190 (Figure 3a). Trenched areas are well off the trail, and would be posted and fenced off to recreation user access during the project duration.

Site 98-4: The proposed access route for Site 98-4 includes a combination of existing trails and creating a temporary path to and from the existing recreational two track trail (Perimeter Trail 190) that was previously used as a fire and recreational use road that was closed to motor vehicles after the SFNF Travel Management Decision in 2012 after the Cerro Grande wildfire in 2000. Access to Site 98-4 trenching areas would be via approximately 0.6 mile (3,168 ft.) of machine cleared cross country routes.

The Forest Service may issue a public closure order specific to the open trenches to enable enforcement of public safety at the open trench sites. Although fenced, the trenches may still pose a feature curiosity to trail users and public passing through the area.

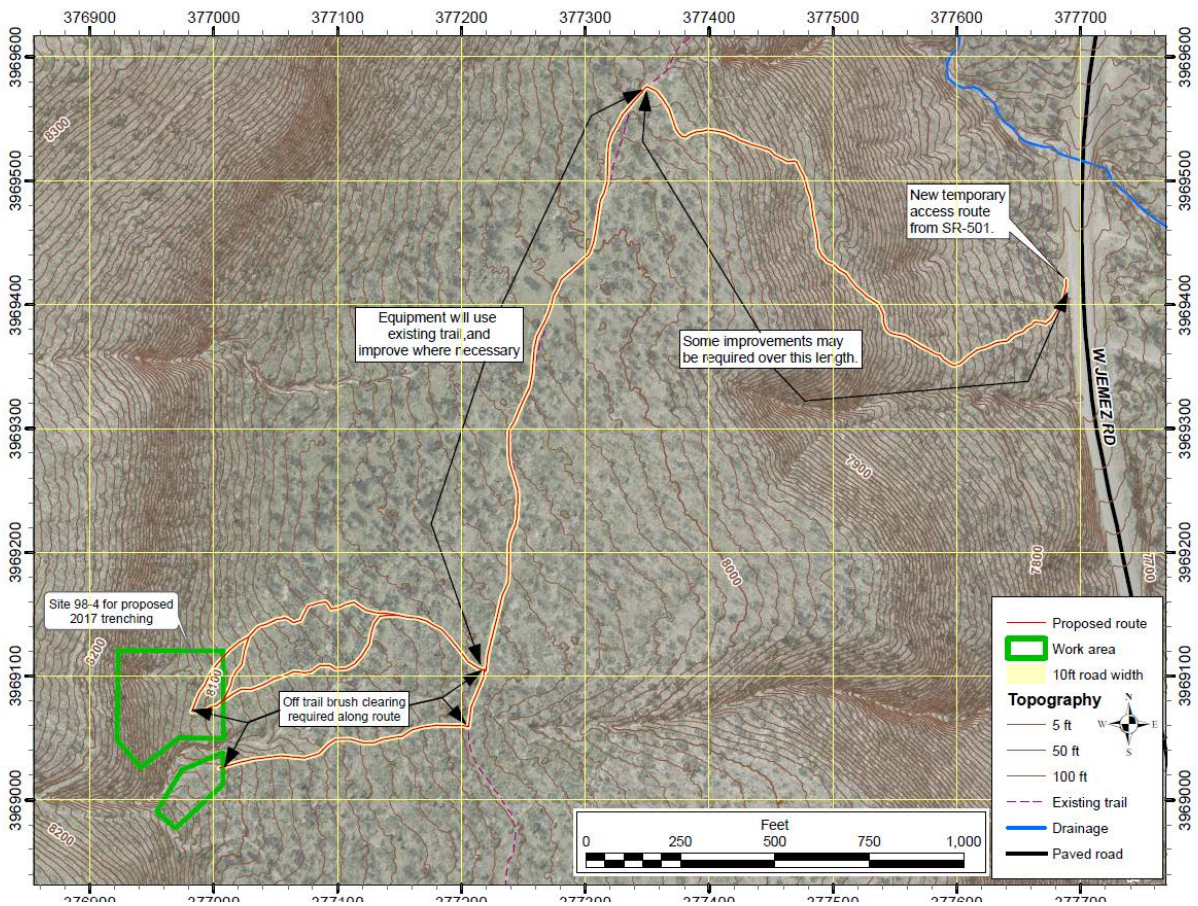

Figure 3a. Site 98-4 proposed access routes.

Site B: The proposed access routes for Site B trenching locations are relatively short, 0.11 miles (580 ft.) and 0.09 miles (475 ft.) respectively, and follow a narrow alluvial ridgeline to the trench sites (Figure 3b).

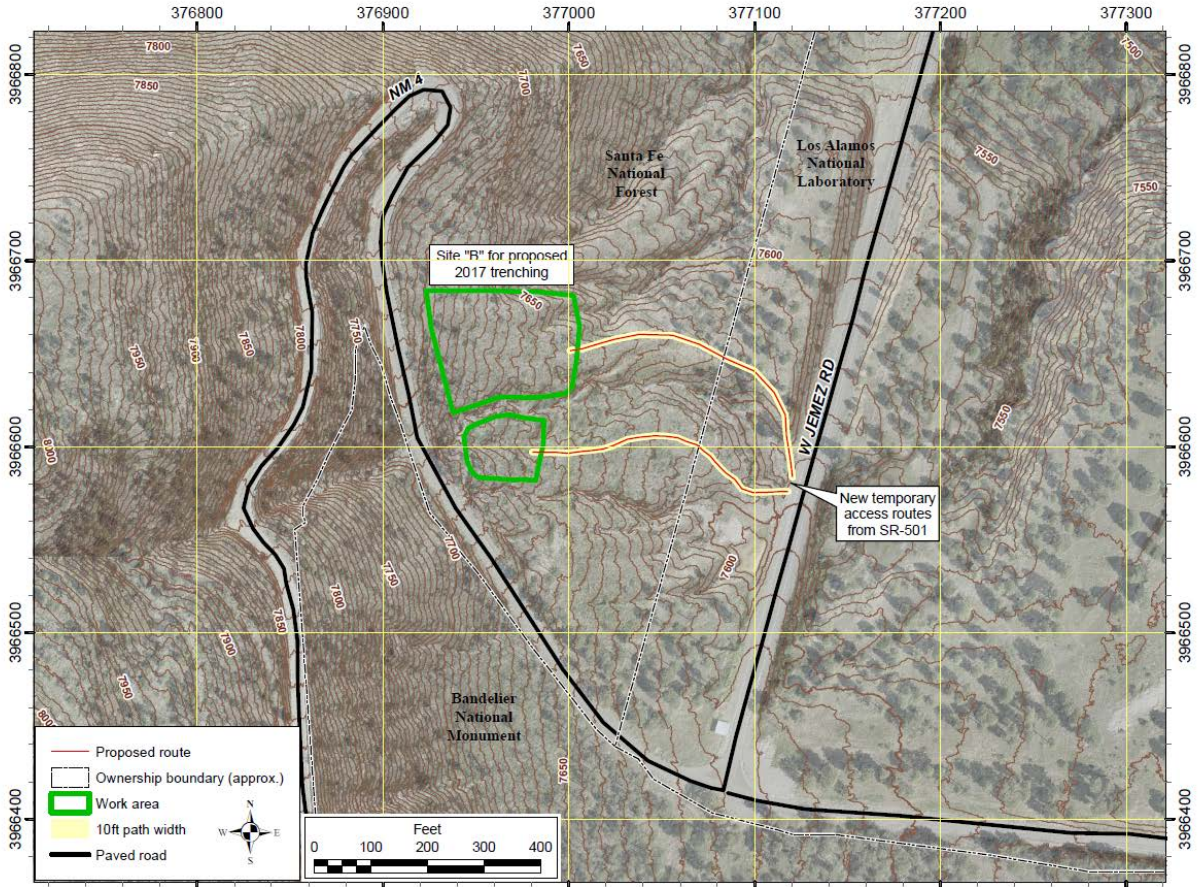

Figure 3b. Site B proposed access routes.

Site 98-4 and Site B Trenching Tasks and Activities: Because the chytrid amphibian pathogenic fungus *Batrachochytrium dendrobatidis* (Bd)[4] has been found in a wild-caught Jemez Mountains salamander in 2003 and identified in other amphibians around the Jemez Mountains (LANL 2016) prior to field activities, a fungal disinfection plan will be in place.

Trenching locations would be re-contoured and reseeded at the end of project (Appendix 2). There would be a maximum of 8 trenches excavated, approximately 6-9 feet wide, 6-12 feet deep, and 330 yards long. Exact trench dimensions would be determined during field investigations. To protect worker health and comply with Occupational Safety and Health Administration regulations, the trenches would be stabilized with the use of hydraulic shoring or benching (Figure 4) depending upon trench width. There would be a minimum of 2 trenches at each site. Trenches would be open for about 8 weeks, allowing scientists to interpret and record data.

[4] BD is a species of "chytrid" (Phylum Chytridiomycota) fungus that is capable of infecting most of the world's amphibian species and is linked to mass mortality events resulting in significant amphibian declines and extinctions.

Hydraulic Shoring

Benching Stabilization

Figure 4. Hydraulic Shoring and Benching Trench Stabilization Techniques

As detailed in Appendix 2, the project team would minimize the disturbance area to limit the areas disturbed, which would limit the areas requiring restoration and revegetation. Permit conditions would require biological monitoring to be conducted before and during project activities to avoid or minimize impacts to federally listed endangered species as required by the USFWS (Appendix 2). In addition, a graduate research project would be initiated at LANL to determine if and how the geology of the Jemez Mountains and the Pajarito fault system influence Jemez Mountains salamander distribution.

Alternative B – No Action Alternative

Under this alternative, the SFNF would not issue a special use permit for the DOE to conduct a geologic investigation titled *DOE/LANL Paleoseismic Trenching Project*. No access road use or trench excavations would occur across segments of the Pajarito Fault System on sites located within Forest System lands west of Highway 501 in Los Alamos County, New Mexico, between Pajarito Canyon and Cañon de Valle.

The DOE's ability to more clearly understand and quantity the seismic risk assumed by LANL operations and development of defensible positions on seismic design basis for LANL facility engineering and safety would be compromised.

Proposed Mitigation Measures

The following would be included in the proposed action in compliance with the Biological Opinion and as requirements in the SFNF special use permit.

Mexican Spotted Owl:

A. Follow all requirements in the SFNF special use permit.

B. Project activities would not cut down trees and shrubs from March through August of any year (the peak bird-nesting season) to ensure bird nestlings and eggs protected under the Migratory Bird Treaty Act are not destroyed.
C. No trees, alive or dead, larger than 18 inches (in.) (46 cm) in DBH (diameter at breast height) are to be removed.
D. Downed logs larger than 18 in. (46 cm) in diameter are to be retained when possible.
E. Restoration vegetation planted in association with the construction of these projects must be native species appropriate for this elevation and forest type.

Jemez Mountains salamander:

A. A new survey of LANL's western boundary with the SFNF will be pursued to determine a clear boundary line.
B. The new segment of road will be designed to be as short as possible while still maintaining minimum safety requirements for grade and slope appropriate to the vehicles planned to be used.
C. Where the roadbed still exists, all logs and rocks removed will be pushed to the side in a way to create future salamander refugia.
D. No road work will occur during wet conditions when salamanders move above ground or during storm events (July-September).
E. Road improvements will be designed to have the least amount of ground disturbance as possible and will not exceed a single bladed lane.
F. All equipment access routes must skirt and avoid all standing trees. Potential safety trees will be considered on a case-by-case basis.
G. Permitted biologists will be present during road work to identify potential salamander refugia that would require a pause in road clearing until adequate surveys of the immediate area were completed.
H. Coordination with Service staff will occur at all times during the project.
I. Service staff will observe project activities as frequently as needed or requested.
J. Areas of disturbance will be restored with native plants appropriate to the local mixed conifer habitat-type.
K. Because disease is a primary threat to the Jemez Mountains salamander and the chytrid amphibian pathogenic fungus *Batrachochytrium dendrobatidis* (Bd) has been found in a wild-caught Jemez Mountains salamander in 2003 and identified in other amphibians around the Jemez Mountains (LANL 2016). In consideration of these factors, prior to field activities, a fungal disinfection plan will be in place. The plan will address requirements to aide in preventing the introduction or spread of the fungus. Plan requirements would include the application of disinfectant to all field tools, machinery, vehicles, and work boots before entry, between separate sites, and after exiting the field. Decontamination will occur prior to entry and exit from the trenching sites. All project personnel and all field equipment used within designated critical habitat will be required to follow the disinfectant protocol standards set to ensure Bd is not transported between sites.
L. Excavated material will be placed on tarps adjacent to the trenches when feasible. This would ensure that interstitial spaces used by salamanders to reach subterranean habitat would be preserved.
M. A graduate research project will be initiated at LANL to determine if and how the geology of the Jemez Mountains and the Pajarito fault system influence Jemez Mountains salamander distribution. This area of research is lacking for this species and could result in significant contributions to the understanding of the species, which could ultimately influence its management.

N. Other areas that could be affected by the Proposed Action to ascertain take of Jemez Mountains salamanders and/or loss of its habitat that causes harm or harassment to the species. This monitoring is to be accomplished using protocol established in cooperation with the USFWS prior to the implementation of the Proposed Action
O. Activities in salamander critical habitat would occur outside of the surface-active season of the Jemez Mountains salamander (June 15 through October 30) or would incorporate measures to avoid impacting the species (USFWS 2017), unless otherwise agreed upon and documented between LANL and USFWS.
P. LANL is to submit annual monitoring reports to the USFWS New Mexico Ecological Services Field Office within 90 days of the completed Proposed Action or no later than December 31, 2017. The first report was submitted to and accepted by the USFWS on November 20, 2017. An additional report would be submitted by LANL either at the conclusion of the project or end of year 2018 (LANL 2017). These reports are to briefly document the effectiveness of the term and condition and locations of Jemez Mountains salamander(s) observed, and, if any are found dead, the suspected cause of mortality.

Additional mitigation measures include:

A. Compliance with the Migratory Bird Treaty Act requires that no vegetation removal occurs during the peak bird breeding season, May 15 through July 31, unless a biologist has conducted a nest check to ensure that there are no nesting birds present. If active nests are found, the nest tree or bush would be left until the nesting is complete.
B. Re-contouring and reseeding of construction scarred pathways and trench site locations.
C. Protection of the public during the project would entail fenced off trenched areas using portable temporary metal fencing 60 inches tall with locking gates and several signs, both on fences and at the entrance to the site.
D. For protection of the local fauna, at least one end of every trench would be ramped so that wildlife, should they get in the trench, have an escape route.

Mitigations for Cultural Resources:

A. A LANL Archaeologist will be on site to monitor all ground disturbance for both site access and trench excavation. Santa Clara Pueblo will be notified when this work will begin.
B. Should any of the following plants be located in the disturbance path, they should be avoided: yarrow, goldenrod, osha, Douglas fir, ponderosa pine, and broom reed grass.

Comparison of Alternatives

Table 1: Comparisons of Alternatives

Environmental Factor	Alternative A Proposed Action	Alternative B No Action

Geology and Soils (geologic hazards, soil productivity, capability, erodibility, and mass failure)	Soil would be excavated to bedrock. During trench excavations, the top soil would be segregated and replaced at the ground surface and at project conclusion the disturbed sites would be revegetated with temporary annuals to limit weed establishment, and restore habitat. A dual purpose of the re-contouring and revegetation is to prevent reuse of the temporary access paths by the public after the proposed study is completed.	There would be no effect to geology or soils.
Wildlife	There would be temporary and localized effects to wildlife in the area from project activities. **Threatened and Endangered Species**: Approximately 12 acres of habitat would be affected. The USFWS Biological Opinion stated "*After reviewing the current status of the Jemez Mountains salamander, the environmental baseline for the action area, the effects of the Proposed Action and the cumulative effects, it is the Service's biological opinion that the LANL paleoseismic trenching project, as proposed, is not likely to jeopardize the continued existence of the Jemez Mountains salamander, and is not likely to destroy or adversely modify designated critical habitat." There would likely be incidental take.*	There would be no effect to wildlife.
Recreation	Approximately 0.34 miles (1,795 ft.) of Perimeter Trail 190 would be effected by minor trail improvements for heavy vehicle access and driving the heavy equipment to the trenching sites. Trail detours during trail improvement activities would be short. During heavy vehicle transport, recreational users would be asked to step aside for a matter of minutes while heavy vehicles pass by them.	Perimeter Trail 190 would not have a closed segment nor would the public be prohibited from any other areas. There would be no land disturbance. The portion of Perimeter Trail 190 used for the project would not be improved as a result of the project.

	Trenching areas would have no effect to Perimeter Trail 190 recreational users as the areas are at least 100 ft. from the trail. An estimated area of 6 acres at the trenching location sites would be temporarily closed to the public for the project duration.	
Invasive and Noxious Weeds	Removal of vegetation and soil disturbance can lead to weed establishment. Surface re-contouring and revegetation with temporary annuals appropriate for the area or sterile hybrids which is intended to lessen weed establishment at the temporary trails and trenching locations would be required. Additionally, equipment will have undergoing decontamination prior to site access and egress which will also serve to prevent the introduction of weeds.	There would be no increase of invasive and noxious weeds as a result of the project.

Required Monitoring

Special Use Permit conditions would require biological monitoring before and during project activities to minimize and/or document impacts to the Jemez Mountains salamander as required by the USFWS. LANL/DOE will be required to monitor the access routes and project area for noxious weeds for one year post reclamation, and to remove any noxious weeds growing. The New Mexico noxious weed list will be used to define noxious weeds.

SECTION 3: ENVIRONMENTAL EFFECTS

Introduction

This section presents the affected environment and potential environmental consequences for the Proposed Action for those environmental resource areas identified as relevant for this EA. The No Action alternative would retain the status quo; that is there would be no change to current environmental conditions. Resource specialists analyzed the magnitude of direct, indirect, and cumulative effects of the Proposed Action on both short and long-term productivity. Only information necessary to understand the environmental consequences is included in this document. The project record contains all project-specific information and is located at the Española Ranger District Office. Information from the record is available upon request.

The environmental effects analysis uses a sliding-scale approach that focuses on identified issues from implementation of the Proposed Action and potential impacts to those resources. Less depth and breadth of analysis are applied to resource areas having clearly no or minor impacts on the human environment. Those resources are identified Table 2: Resources Not Affect by the Proposed Action. Greater depth and breadth of analysis are applied to resource areas having potentially larger impacts.

A screening analysis was performed to identify resource areas warranting more detailed analyses. The only resources clearly affected by the Proposed Action are geology and soils, wildlife (including Threatened and

Endangered Species) invasive and noxious weeds, and recreation; therefore, the analysis of direct, indirect, and cumulative impacts are focused on these four categories.

Resources not affected by the Proposed Action:

Table 2 and previous area descriptions provides further information regarding these resource areas and why there would be little to no effect upon them from implementation of the Proposed Action.

Table 2: Resources Not Affected by the Proposed Action

Environmental Factor	Alternative A Proposed Action	Alternative B No Action
Air Quality	This project would have minor, temporary particulates from dust from excavation activities.	There would be no effect to air quality.
Water Resources (surface and groundwater quality and quantity, groundwater recharge, and streamflow regimes)	There is no surface water within or directly adjacent to the project areas. There are no wetlands in or within 100 yards near the project areas. The access routes and excavation sites are not within the 100-year floodplain. Trench excavation would not occur to groundwater depth. To prevent erosion and sediment transport to downstream water bodies re-contouring and revegetation would occur at vehicle scarred sites [pathways] and trenching locations.	There would be no effect to water resources.
Noise	There would be minor, temporary elevated noise levels during trench excavation.	There would be no effect to ambient noise levels.
Cultural Resources (archeological and historical)	In compliance with Section 106 National Historic Preservation Act, the entire project area of 12.5 acres was pedestrian surveyed in March 2017. No cultural resources were discovered within the area of potential effect. (DOE 2017).	There would be no effect to cultural resources.
Visual Resource Management	The proposed trench locations would not be visible from West Jemez Road (NM Highway 501) or users of Perimeter Trail 190. Following project completion disturbed areas would be re-contoured and	There would be no effect to the visual environment.

	revegetated to restore effected areas to their natural conditions.	
Human Health – Worker Health	To protect worker health and comply with Occupational Safety and Health Administration regulations, the trenches would be stabilized with the use of hydraulic shoring or benching (Figure 3) depending upon trench width. During project duration, best health and safety management practices would be employed that are protective of workers.	There would be no effect to human health.
Socioeconomics	Scientists are from the existing LANL workforce.	There would be no effect to socioeconomics.
Environmental Justice	The project would not affect any communities in the region. There are no health hazards from the proposal that would affect any communities.	There would be no effect to Environmental Justice communities.
Infrastructure (roads, utility corridors, communications, systems, energy & fuels, distribution systems, and water)	Temporary road improvements or new sections would be necessary to allow access of equipment to the trenching sites. Road improvements could include removal of obstacles such as large rocks, shrubs growing in the road, and road re-contouring. Roadways would be re-contoured and revegetated after completion of the project.	There would be no effect to infrastructure.
Waste Management	There may be minor amounts of construction waste (e.g., fencing, wooden boards, tape and paper) that if generated would be disposed of in a landfill.	There would be no generation of waste.

Geology and Soils

Affected Environment

Soils are typical of the area and support a variety of grasses, forbs, shrubs, and trees. Plant cover, which protects the soil resources, ranges from bare ground to thick grasses depending upon slope and moisture regime. The fault system of interest is in the near-surface sediments and tuffaceous bedrock. The topsoil is thin, but not absent. All of the trench sites are positioned on slopes, where erosion naturally occurs on the slope face and deposition occurs at the foot of the slope. Previous trenching in the area of Site 98-4 revealed poorly sorted sandy-silt to silty-sand colluvium with angular tuff facies; matrix-supported debris flows; talus-like soil units (high angular cobble content with little matrix); and clayey soil horizons. In places there

is as much as 4 meters thick post-Bandelier Tuff stratigraphy including silty-sand gravel, fine sandy silt gravel, silt with sand and gravel, clean silt, and clayey sand with gravel. The Site B area contains up to 2 meters of post-Bandelier Tuff stratigraphy including bouldery slope wash colluvium, poorly-consolidated stratified gravelly sand, massive gravelly sand, and clayey horizons developed on the colluvium.

Effects to soils from the Proposed Action

Direct Effects: Access routes would result in ground disturbance and related soil compaction from driving heavy vehicle to the trenching sites. Backhoes or trackhoes would be tracked to minimize direct soil disturbance and compaction compared to comparable sized tired vehicles. The temporary access paths would require clearing low brush, removal of small shrubs, and moving existing fallen trees and logs out of the vehicle pathway; each activity would compromise the soil surface. However, vehicle passage would result in the crushing of vegetation into the soils adding protective cover which would tend to stabilize the soil surface until the areas are revegetated. Due to existing erosion and exposure of large rocks, Perimeter Trail 190 improvements are necessary for vehicle passage and would involve stabilization and re-contouring of the trail. This would be an improvement to current conditions. At the conclusion of the project, the access routes [excluding Perimeter Trail 190] would be re-contoured and revegetated with temporary annuals to limit invasive weeds, and native plants appropriate for this elevation and forest type to offset the impacts to soils and vegetation,. A dual purpose of the re-contouring and revegetation is to prevent reuse of the temporary access paths by the public after the proposed study is completed.

Vegetation would be removed at the trenching footprint and soil would be excavated to bedrock. To perform this work, small tracked excavators would be used to dig the trenches and place the soil safely adjacent to the trench. Topsoil would be segregated in separate spoils piles. Afterward, the trenches would be backfilled with the originally-excavated materials and seeded.

Indirect Effects: Post project, the access paths, other than Perimeter Trail 190, may encourage their continued use by the public. Therefore, a dual purposes of the re-contouring and revegetation is to prevent reuse of the temporary access paths by the public after the proposed study is completed along with erosion prevention and weed establishment.

Affected Environment

The project sites all occur in either mixed shrublands or New Mexico Locust (*Robinia neomexicana*) shrublands. The access routes traverse both shrublands and ponderosa pine (*Pinus ponderosa*) woodlands. (LANL 2016)

WILDLIFE

Southwestern Region Sensitive Species: A review and the USDA Forest Service Southwestern Region Sensitive Species lists for animals and plants and the August 17, 2016 *Initial List of Species of Conservation Concern for the Santa Fe National Forest* indicates that one species, the Northern Goshawk (*Accipiter gentilis)* may occur in the trenching region.

Management Indicator Species: A review of the list of Management Indicator Species (MIS) for the SFNF as identified in the Environmental Impact Statement from the SFNF Land Management Plan (USDA 1987) indicates that three of the eight MIS occur or have habitat in or adjacent to the project area. MIS were

selected to represent certain plant communities and seral habitats which proposed management activities could affect. The three MIS are:

Elk (*Cervus elaphus*): Elk populations throughout their range are secure widespread, and abundant. Elk are commonly seen in all forest types in the project area on slopes less than 40%. They use higher elevations on the Valles Caldera during warmer months, breed in the fall, move to lower elevations in deep winter snows, and calve in the spring. The lack of openings, water, and forage vegetation limit elk habitat in the area, but hiding and thermal cover is plentiful.

Merriam's turkey (*Meleagris gallopavo merriami*): Turkeys use a wide variety of habitat types, preferring mature and old growth ponderosa pine forests. Trees are used for roosting and provide food, escape, and resting cover. Turkeys forage in open forest interspersed with shrubs, tall grasses, and forbs. They range widely, often moving 5-20 miles between summer and winter habitats. The project area provides adequate nesting and roosting habitat but foraging and water are limited. The lack of vegetative diversity limits the food supply.

Hairy woodpecker (*Picoides villosus*): This forest generalist and cavity nesting species prefers large mature snags and large aspen trees for nesting. It is widely distributed wherever there are mature forests with substantial snags and forages in large tree trunks and down logs that provide insects. This species is common in ponderosa pine forests as well as other forest and woodland types. As a primary cavity nester, this woodpecker is dependent on dead and dying portions of live trees and snags for nesting.

FEDERALLY THREATENED AND ENDANGERED SPECIES

Federally Listed Species: Two federally listed species were addressed in the USFWS Biological Opinion for the Proposed Action: the federally threatened Mexican Spotted Owl (*Strix occidentalis lucida*) and its designated critical habitat and the federally endangered Jemez Mountains salamander (*Plethodon neomexicanus*) and its designated critical habitat.

Mexican Spotted Owl: The Mexican Spotted Owl is found in northern Arizona, southeastern Utah, southwestern Colorado, New Mexico, west Texas, and into Mexico. It is the only subspecies of Spotted Owl recognized in New Mexico. The Mexican Spotted Owl generally inhabits mixed conifer and ponderosa pine-gambel oak forests in mountains and canyons. High canopy closure, high stand diversity, multilayered canopy resulting from an uneven-aged stand, large mature trees, downed logs, snags, and stand decadence, as indicated by the presence of mistletoe (*Phoradendron* spp), are characteristic of Mexican Spotted Owl habitat. Some have been found in second-growth forests, i.e., younger forests that have been logged; however, these areas were found to contain characteristics typical of old-growth forests. No Spotted Owls were found in forests less than 36 years of age. Mexican Spotted Owls in the Jemez Mountains seem to prefer cliff faces in canyons for their nest sites. The recovery plan for the Mexican Spotted Owl recommends that mixed conifer and pine-oak woodland types on slopes greater than 40 percent be protected for the conservation of this owl. Although seasonal movements vary among owls, adults commonly remain within their summer home ranges throughout the year. (LANL 2016)

The project area is within the Mexican Spotted Owl critical habitat. There are four protected activity centers located within 5 mi (8 km) of the center of the project area. On the north side of the project

area, the nearest protected activity center is in upper Los Alamos Canyon, 1.4 mi (2.25 km) to the north. On the south side of the project area, the nearest protected activity center is in Alamo Canyon, 1.4 mi (2.25 km) to the south. The Las Conchas wildfire greatly impacted these protected activity centers. There are no current or recent occupancy data available. (LANL 2016)

Jemez Mountains Salamander: The Jemez Mountains salamander is endemic to the Jemez Mountains of north-central New Mexico and is found in Los Alamos, Rio Arriba, and Sandoval counties. The Jemez Mountains salamander occurs predominantly at elevations ranging from 6,988 to 11,254 ft. (2,130 to 3,430 m) in mixed-conifer forest with greater than 50 percent canopy cover consisting mainly of Douglas-fir (*Pseudotsuga menziesii*), blue spruce (*Picea pungens*), Engelmann spruce (*Picea engelmannii*), white fir (*Abies concolor*), limber pine (*Pinus flexilis*), quaking aspen (*Populus tremuloides*), and ponderosa pine (*Pinus ponderosa*). The ground surface in forest areas will have (a) moderate to high volumes of large fallen trees and other woody debris, especially coniferous logs at least 10 in. (25 cm) in diameter, particularly Douglas-fir, which are in contact with the soil in varying stages of decay from freshly fallen to nearly fully decomposed or (b) structural features, such as rocks, bark, and moss mats that provide the species with food and cover. Underground habitat in forest or meadow areas will contain interstitial spaces provided by (a) igneous rock with fractures or loose rocky soils, (b) rotted tree root channels, or (c) burrows of rodents or large invertebrates.

The Jemez Mountains salamander is completely terrestrial, and does not use standing surface water for any life stage. Present in its habitat year-round, this species spends most of its life underground, but can be found on the surface when conditions are warm and wet—approximately July through September. During this time, the Jemez Mountains salamander can be found under rocks, bark, and moss mats and inside and under logs. The salamanders eat invertebrates, including ants, mites, and beetles, and are thought to lay their eggs underground.

Under the LANL Threatened and Endangered Species Habitat Management Plan, Jemez Mountains salamander habitat was modeled at LANL based on a combination of topographical features and macro-level vegetation classifications. Areas defined as suitable habitat were delineated in 2012. Suitable Jemez Mountains Salamander habitat includes Los Alamos Canyon, Two-mile Canyon, Pajarito Canyon, and Cañon de Valle. Designated critical habitat occurs immediately west of LANL's western boundary.

The project area is within the defined Jemez Mountains salamander critical habitat. Seven surveys were conducted in the summer of 2016 within the proposed trench site locations and along the preferred access route. One Jemez Mountains salamander was detected in an area of low burn intensity bordering on areas that were moderately burned in the 2011 Las Conchas wildfire (LANL 2016).

Compliance with the Migratory Bird Treaty Act requires that no vegetation removal occurs during the peak bird breeding season, May 15 through July 31, unless a biologist has conducted a nest check to ensure that there are no nesting birds present. If active nests are found, the nest tree or bush would be left until the nesting is complete.

Effects to Ecological Resources from the Proposed Action

Direct Effects:

Southwestern Region Sensitive Species: The Northern Goshawk, a Forest Service Southwestern Region Sensitive Species and a Species of Conservation Concern for the Santa Fe National Forest, habitat preference is in mature forests with large trees. Therefore, it is highly unlikely that the Proposed Project would affect the hunting or nesting habitat of the Northern Goshawk nor result in a trend toward Federal listing or loss of population viability.

Management Indicator Species: A total of 12 acres of potential MIS habitat could be temporarily affected under the Proposed Action. It is expected that MIS would temporarily avoid areas where project activities are being conducted. The affected areas would be re-contoured and revegetated, thus, the habitat would be restored after project completion. Trenching area would not be attractive feeding grounds due to the presences of personnel, noise, cleared trench areas void of vegetation, and surrounding fences. There will be no permanent reduction in number of acres of available habitat for any MIS and no potential for MIS population declines due to the Proposed Action.

Federally Listed Species

Mexican Spotted Owl: Potential impacts from the proposed action would be primarily from noise and temporary modification of hunting habitat. Noise sources are a potential disturbance to Mexican Spotted Owls. Infrequent, noise-producing activities are generally assumed to have relatively little long-term impact. However, owls will react to noise disturbances by changing behavior and/or flushing from their perches. These behavioral responses may alter nesting and roosting activities, thus increasing vulnerability to predators and heat-related stress. During the trenching operations, average noise levels will increase compared with current background levels. The operation of excavators or other similar heavy equipment will be in use at times during this project. Based on a noise attenuation modeling noise from a point source such as heavy equipment would attenuate to background levels at a distance of approximately 3000 ft. This conservative estimate indicates that heavy equipment operation should not be perceptible over background noise levels in the Mexican Spotted Owl protected activity centers nearest the project area. (LANL 2016)

Suitable nesting or roosting habitat for the Mexican Spotted Owl will not be removed during the proposed action. Shrub removal and other ground disturbance would only have temporary effects to the owl's potential prey base. (LANL 2016)

The USFWS in their BO concurred with the impacts analysis conclusions stated above provided that the Proposed Action incorporate the mitigation measures specified in the BO (see Proposed Mitigation Measures section) that were designed to mitigate any adverse impacts to the Mexican spotted owl or its habitat, including breeding season restrictions. For these reasons, the USFWS considered "the effects of your proposed action to be insignificant and discountable to the Mexican spotted owl." (USFWS 2017)

Jemez Mountains Salamander: The project area is within designated critical habitat for the Jemez Mountains salamander. In 2016, one salamander was found during a project survey within 0.5 miles of the project area. Direct effects to salamanders would be greatly reduced since LANL will not be conducting most activities when salamanders may be active at the surface (June 15 through October 30) or have incorporated project measures to avoid or minimize impacting the species. The maximum potential loss of habitat from this action could be up to 12 acres in total. The effects of this disturbance will be short term,

with all work on access routes and trench locations being completed within a month. This action is not a recurring action; therefore, any disturbance would be temporary in nature. Also, the intensity of this disturbance is minimal as it encompasses a very small portion of designated critical habitat and the project will maintain as small of a footprint as possible at any location to limit disturbance (USFWS 2016).

The USFWS stated that an incidental take of Jemez Mountains salamanders is "reasonably certain to occur" as a result of the Proposed Action. Additionally, the USFWS biological opinion is "that the LANL paleoseismic trenching project, as proposed, is not likely to jeopardize the continued existence of the Jemez Mountains salamander, and is not likely to destroy or adversely modify designated critical habitat." (USFWS 2016). Further the USFWS reasoning for their conclusion as stated in their BO is as follows:

> *"After reviewing the current status of the Jemez Mountains salamander, the environmental baseline for the action area, the effects of the proposed action and the cumulative effects, it is the Service's biological opinion that the LANL paleoseismic trenching project, as proposed, is not likely to jeopardize the continued existence of the Jemez Mountains salamander, and is not likely to destroy or adversely modify designated critical habitat. We base our conclusion on the following:*
> *1. LANL has identified suitable conservation measures that will be incorporated into the proposed action, which will reduce impacts to the Jemez Mountains salamander and its designated critical habitat, as well as manage for the recovery of Jemez Mountains salamanders on the Santa Fe National Forest.*
> *2. Activities in salamander critical habitat will occur outside of the surface active season of the salamander (June 15 through October 30), or will incorporate measures to avoid impacting the species, unless otherwise agreed upon and documented between LANL and USFWS.*
>
> *The conclusions of this biological opinion are based on full implementation of the project as described in the Description of the Proposed Action section of this document, including any Mitigation Measures that were incorporated into the project design."*

Indirect Effects: No permanent indirect effects have been identified as all construction scarred and trench locations will be re-contoured and reseeded.

Invasive and Noxious Weeds

Weeds are spread by animals, humans, and vehicles.

Invasive weeds include cheat grass, bind weed, and bull and musk thistles.

Noxious weeds in New Mexico include (NM EMNRD 2009):

Commom Name Scientific Name

- Alfombrilla *Drymaria arenariodes*
- Black henbane *Hyoscyamus niger*
- Camelthorn *Alhagi psuedalhagi*
- Canada thistle *Cirsium arvense*
- Dalmation toadflax *Linaria dalmatica*
- Diffuse knapweed *Centaurea diffusa*
- Dyer's woad *Isatis tinctoria*
- Eurasian watermilfoil *Myriophyllum spicatum*
- Giant salvinia *Salvinia molesta*
- Hoary cress *Cardaria spp.*
- Hydrilla *Hydrilla verticllata*
- Leafy spurge *Euphorbia esula*
- Oxeye daisy *Leucanthemum vulgare*
- Parrotfeather *Myriophyllum aquaticum*

- Purple loosestrife *Lythrum salicaria*
- Purple starthistle *Centaurea calcitrapa*
- Ravenna grass *Saccharum ravennae*
- Scotch thistle *Onopordum acanthium*
- Spotted knapweed *Centaurea biebersteinii*
- Yellow starthistle *Centaurea solstitialis*
- Yellow toadflax *Linaria vulgaris*

Noxious weeds were not inventoried in the immediate project area.

Direct Effects: The Proposed Action specifies the re-contouring of disturbed areas and revegetation with temporary annuals and native plants appropriate for the area. Topsoil stockpiles will be seeded with an interim mix to lessen potential establishment of noxious and invasive weeds. Temporary annuals, such as sterile hybrids, may take the niche of invasive and noxious weeds so as to minimize or prevent weed establishment at the temporary routes and trenching locations. Additionally, equipment will be thoroughly washed prior to site access, which will also serve to lessen the introduction of weeds. However, even with these precautions invasive weeds may increase until the native vegetation reestablishes and matures. LANL will be required to monitor and remove any noxious weeds in the list above that establish on the access routes and pit locations for one year after project completion and reclamation.

Indirect Effects: There could be a long term (greater than one year) increase in invasive weeds in the project area.

Recreation

Affected Environment
The proposed project trenching site locations are located within the Española Ranger District recreational area used by the LANL employees, residents in Los Alamos County and surrounding communities for recreation activities including hiking, running mountain biking, and hunting. Perimeter Trail 190 is a Forest Service System trail that will be affected by the proposed action.

Effects to recreation from the Proposed Action
Implementation of the Proposed Action would result in the following effects:

Direct Effects: A Special Use Permit for the existing site would allow for the temporary use of approximately 0.34 miles (1,795 ft.) of Perimeter Trail 190 and for minor trail improvements for heavy vehicle access and driving the heavy equipment to the trenching sites. Trail detours would be brief with recreational users guided by project personnel to an appropriate and safe cross country detour around the trail improvement area. Vegetation in the affected areas is not so dense as to effect a barrier to off-trail travel. During heavy vehicle transport, recreational users would be asked to step aside for a matter of minutes while heavy vehicles proceed or pass by them.

Trenching areas would have no effect to Perimeter Trail 190, since the trenching areas are at least 100 ft. from the trail. For safety consideration the recreational users going cross-county would be prevented from entering the trenched areas by fencing and signage. If necessary, a Forest Service closure order would be put in place for the trenching disturbance for the life of the project, which could be up to 8 weeks. This order could be put in place to enforce the closure of the trench areas in order to protect public safety. The trenching area is not a location typically used by the recreating public and can be easily avoided by those travelling cross country in the area. The new off trail access and trenching may create curiosity for trail users who would wish to visit the area based on a desire to see what is occurring. Normally, the trench area

would not be considered a target recreation area and the trench closure would not affect current recreation opportunities.

Indirect Effects: Perimeter Trail 190, where eroded or otherwise adversely effected from past use or project associated heavy vehicle use, would be restored and improved compared to past conditions. Trail would be leveled and appropriate drainages added to create long term sustainability.

Cumulative Impacts

Cumulative effects are the result of the incremental effects of the Proposed Action added to the effects of other past, present, and reasonably foreseeable future actions, regardless of whether or not the agency or person undertakes them and regardless of land ownership on which other actions occur.

Geology and Soils

Geology and soil disturbance is temporary and would not add cumulatively to the existing disturbance that comprise LANL and the Los Alamos community. Therefore cumulative effects for this resource will not be analyzed.

Wildlife

No project impacts have been identified for wildlife species, including sensitive and management indicator species, or their habitat. Therefore, no cumulative impacts are projected. The re-contouring and revegetation requirements will restore the habitat to previous conditions.

Similarly the Federally listed species are not expected to sustain any cumulative impacts. Addressing the Jemez Mountains salamander specifically the USFWS stated in their BO:

> *"Cumulative effects include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this biological opinion." "We do not anticipate any cumulative effects from this proposed action."*

Invasive and Noxious Weeds

The project area is small in relation to the disturbance footprint of LANL, existing roads, fire disturbed soils, and the Los Alamos Community. This project could add a very small incremental increase in invasive weeds to the region, either short term or even long term. Invasive weeds do contribute to soil development and future support of native vegetation. The potential increase of invasive weeds from this project is almost microscopic given the fire disturbed footprint in the surrounding areas that are currently affected by invasive weeds. Therefore a more extensive analysis of cumulative impacts is not warranted. No cumulative effect of noxious weeds is expected due to the requirement for LANL/DOE to monitor and remove any noxious weeds in the project area for one year post reclamation.

Recreation

There are no impacts to recreation other than minor and short term inconveniences to users. The land area is great enough that off trail users would not be affected. Therefore, if there are no real project impacts to recreation, there would not be cumulative impacts.

SECTION 4: CONSULTATION WITH OTHERS

Who was consulted?

Public

More than 200 individuals were notified of the proposal via email using the Forest Service Internet delivery system.

Tribal Governments

The following Tribal Governments were notified of the Proposed Action during the scoping period:

- Ohkay Owingeh Pueblo
- Pueblo de Cochiti
- Pueblo de San Ildefonso
- Pueblo of Nambé
- Pueblo of Tesuque
- Santa Clara Pueblo

Federal Government

United States Department of the Interior, Fish and Wildlife Service, New Mexico Ecological Services Field Office were notified during the scoping period.

Who prepared this document?

Espanola Ranger District, Santa Fe National Forest

- Lynn Bjorklund – NEPA and Recreation Specialist
- Amy Raulin – Wildlife Biologist

Department of Energy/National Nuclear Security Administration, Los Alamos Field Office

- Kristen Dors – NNSA Environmental Scientist
- Charles Pergler – NEPA Support Contractor
- Renee Robinson – NEPA Support Contractor

LITERATURE CITED

DOE 2016. "DOE Standard: Natural Phenomena Hazards Analysis and Design Criteria for Department of Energy Facilities," Washington D.C., Department of Energy, DOE-STD-1020-2016. December 2016.

DOE 2017. *Los Alamos National Laboratory Cultural Resources Evaluation for the Seismic Hazards Analysis of the Pajarito Fault System, Santa Fe National Forest, New Mexico, Report No. 360, Survey No. 1183.* October 2017.

LANL 2016. Biological Assessment of the Effects of the Paleoseismic Trenching Project to Conduct a Probabilistic Seismic Hazard Analysis of the Pajarito Fault System around Los Alamos National Laboratory. Prepared by: Charles D. Hathcock, Marjorie A. Wright, Brent E. Thompson, David C. Keller, Jesse T. Berryhill, and Karen S. Musgrave Environmental Stewardship Services, Los Alamos National Laboratory/ Prepared for: U.S. Department of Energy, National Nuclear Security Administration, Los Alamos Field Office. LA-CP-16-20525. October 2016

LANL 2017. Email from Chuck Hathcock, Biologist, Environmental Protection and Compliance Division, Environmental Stewardship Group, Los Alamos National Laboratory Subject Heading Report for a BO to and response back from Jodie Smithem, Branch Chief, Aquatic and Terrestrial Ecosystem Conservation, New Mexico Ecological Services Field Office, U.S. Fish and Wildlife Service. November 20, 2017.

NM EMNRD 2009. New Mexico Noxious Weed List. April 2009.

USDA Forest Service 1987. Santa Fe National Forest, Forest Plan, as amended (1996 and 2004). Santa Fe, New Mexico. USDA, Forest Service, Soutwest Region.

USDA Forest Service, 2016. Letter from Calvin N Joyner, Regional Forester, to the Forest Service Supervisor, Santa Fe National Forest, regarding Approval of Initial list of SCC (Species of Conservation Concern).

USFWS, 2017. United States Department of the Interior, Fish and Wildlife Service, New Mexico Ecological Services Field Office. Biological Opinion. Cons. #02ENNM00-2016-F0528. May 1, 2017.

Appendix 1: Biological Opinion

https://www.fs.usda.gov/project/?project=51678

Appendix 2: Site Restoration Plan: Santa Fe National Forest Services – Sites 98-4 and Site B

SITE RESTORATION PLAN: SANTA FE NATIONAL FOREST SERVICE -SITES 98-4 AND SITE B

PALEOSEISMIC TRENCHING SUBC. 365792

June 13, 2017

1.0 Site Restoration

The purpose of this site restoration plan is to outline how the areas disturbed by the proposed project will be restored to a natural appearance. Maps illustrating the location and access paths to Sites 98-4 and B are shown on Figures 1 and 2, respectively. Both sites will be accessed initially from West Jemez Road (NM Highway 501). The proposed access route for Site 98-4 includes a combination of (1) using existing trails and (2) creating a temporary path to and from an existing hiking trail, Forest Service Perimeter Trail 190, which was previously a fire road. (Figure 1). The proposed access route for Site B is relatively short (400-500 ft) and traverses a narrow alluvial ridgeline to the trench site (Figures 2).

As part of creating these temporary access paths and clearing areas for the trench sites, the following activities are anticipated:

- Clearing low brush and removing small scrub oak,
- Moving existing fallen trees and logs, and
- Improvements, potential cuts into the hillside, involving earthwork over limited sections (Site 98-4 only).

Biological monitoring will be completed before and during the above activities to minimize impacts to federally listed endangered species as required by the US Fish and Wildlife Service (USFWS, 2017). Every effort will be made by the project team to limit the areas disturbed. For example, the width of the access paths will be limited to reduce the overall area of disturbance (i.e., a single bladed lane). In many cases, clearing of the trench sites and site access path will only include clearing of small brush and moving downed trees to allow passage of heavy equipment. During trench excavation, the top soil will be segregated and replaced at the ground surface to promote plant growth and site restoration. Short term seeding of the topsoil will occur with short lived aggressive annuals to prevent invasive weed establishment and to prevent the pile from becoming a weed seed stockpile if left for the full 8 weeks. Stockpiles should be low and long to keep the biological components healthy. The Forest Service will provide an appropriate seed mix for the interim topsoil seeding.

In all cases, the project will strive to minimize disturbance, which in turn will limit the areas that require restoration.

1.1 Reclamation Activities

Through informal consultation with the U.S. Forest Service (USFS) personnel, LANL and their contractors have developed a series of reclamation activities. The purpose of the reclamation activities is to return the disturbed areas to their natural appearance, such that the access paths and trench areas will be

difficult to detect upon project completion. A dual purpose of the restoration is to prevent reuse of the temporary access paths by the public after the proposed study is completed and to prevent noxious weeds. To reclaim the site and access paths, the following reclamation activities are proposed:

- At each trench site, excavated trenches will be backfilled and compacted using a compaction wheel in 1-2 ft lifts and the site will be restored as close as possible to the original contour. Figure 3 provides a recent example of a backfilled paleoseismic trench site on LANL property within a forested region directly east of West Jemez Road.
- Disturbed areas and any side slope cuts along the access paths will be restored as close as possible to original contour (e.g., the access path from West Jemez Road to the existing trail).
- Downed or moved trees and logs will be replaced across the reclaimed access path and across the trench sites in accordance with the USFWS Biological Opinion for the Jemez Salamander habitat, as well as for erosion control. Placement of logs will also be arranged to limit detection and use of the access path by motorized and non-motorized traffic.
- Drainage control features (such as wattles and berms) will be used to prevent new riles and rutting.
- Where the existing trails are improved to allow equipment access (i.e., filling of existing ruts, etc.), erosion control features will be installed to help prevent future erosion and improve trail sustainability. Further consultation on a case-by-case basis will be made with the USFS in the field to identify areas of improvement and drainage control measures. LANL anticipates this activity to include placement of limited berms and wattles in select locations and seeding to prevent invasive and noxious weed establishment.
- Seeding will be required on areas of disturbed soils with a Forest Service approved seed mix using temporary annuals, such as sterile hybrids, to compete with noxious and invasive weeds, as well as natives appropriate for the area. Seeding should occur in Spring during a rainy season before May, or late in the season after the first snow fall. Seeds should be spread and lightly raked by hand to insure good seed to soil contact and at a rate appropriate for the mix considering seed size and pounds per acres. Heavy equipment should not be necessary for seeding, given the small areas of disturbed soils. Seeds placed on snow do not need to be raked.
- LANL/DOE will be required to monitor the access routes and project area for noxious weeds for one year post reclamation, and to remove any noxious weeds that establish. The New Mexico noxious weed list will be used to define noxious weeds. (See EA reference)

To limit further disturbance during construction and use of the access paths and at the trench sites, best management practices (BMPs) will be employed that follow guidance provided by the USFWS, including: (1) washing of equipment, vehicles, and hand tools and (2) a thorough washing of equipment and tires/tracks to prevent transport of noxious weeds between sites. As per the USFWS guidance, the project team will avoid adverse conditions (e.g., frozen soils, snowy or very wet soils) during site and pathway reclamation activities. Contract reclamation activities will be coordinated with the Forest Service to best establish new water diversion features to create a better long term, sustainable trail in sections that were used as access for the project.

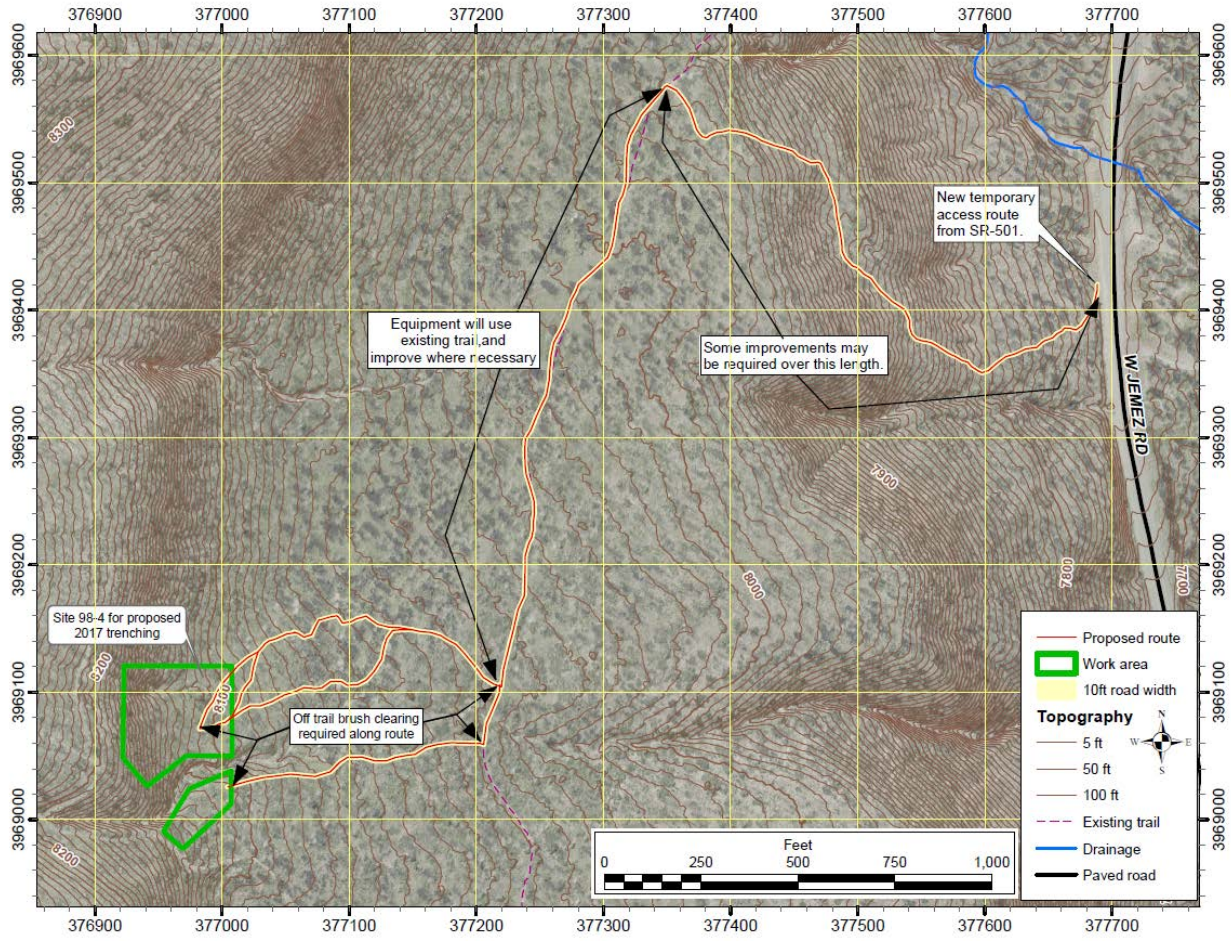

Figure 1. Access map for Site 98-4 from West Jemez Road. Note: the temporary access path will require some ground improvements, trail maintenance, and brush clearing.

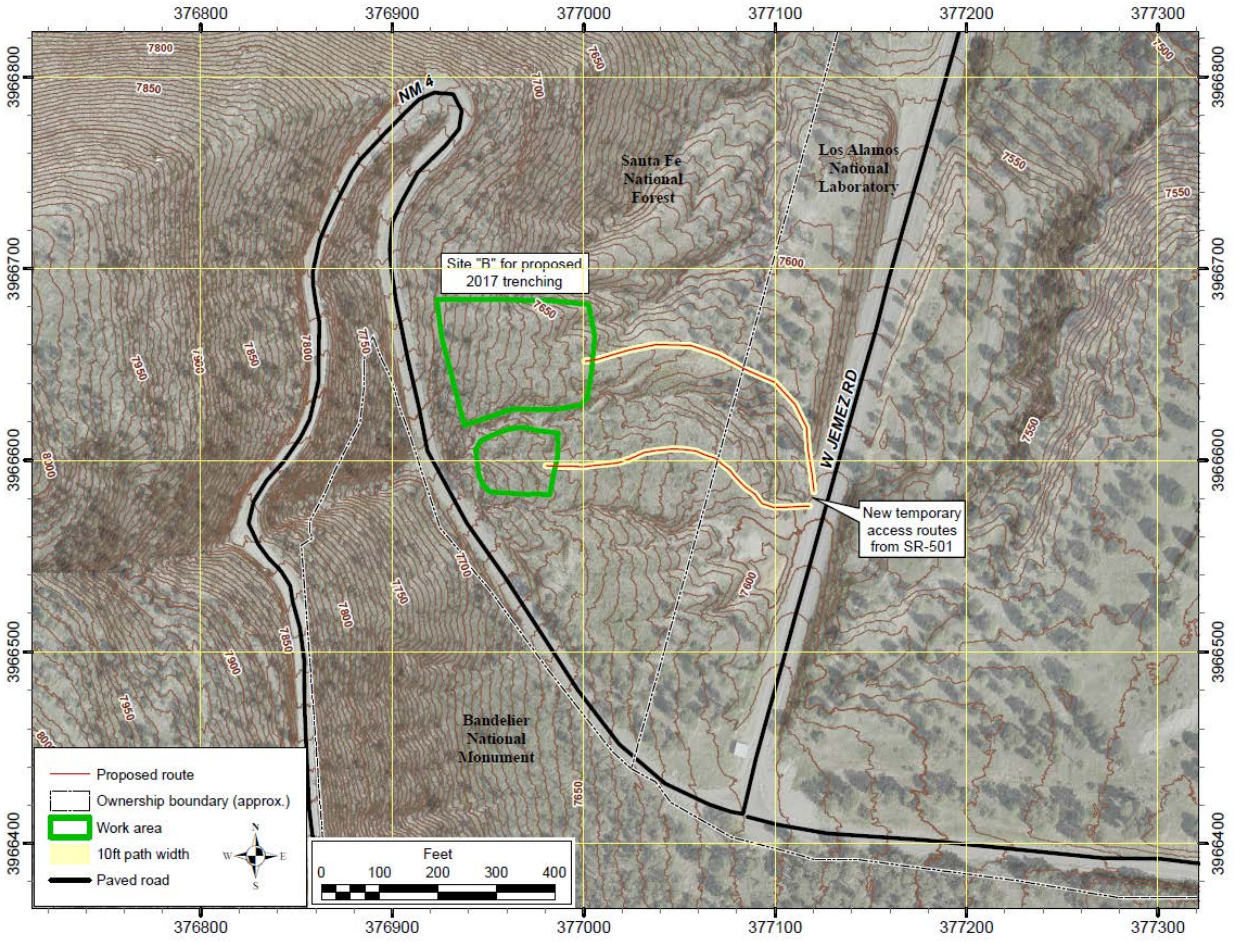

Figure 2. Access map for Site B from West Jemez Road near intersection with New Mexico State Route 4. Note: the access path for the sites will require only limited brush clearing and limited (if any) ground improvements.

Figure 3. Photograph of a backfilled trench site on LANL property. Red arrows mark the approximate location of the backfilled trench.

USDA

United States
Department of
Agriculture

Forest Service

Santa Fe
National Forest,
Region 3

May 2018

DECISION NOTICE AND FINDING OF NO SIGNIFICANT IMPACT

Española Ranger District
Santa Fe National Forest

Santa Fe County,

New Mexico

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Introduction

The United States Department of Agriculture (USDA) Forest Service's (USFS) Española Ranger District (District) within the Santa Fe National Forest (SFNF) has reviewed an application for a special use permit to conduct a geologic investigation submitted by the Department of Energy (DOE) on behalf of Los Alamos National Laboratory (LANL or Laboratory), titled *DOE/LANL Paleoseismic Trenching Project* (Trenching Project). The regional setting is shown in Figure 1. The project would entail excavating trenches across segments of the Pajarito Fault System on sites located within Forest System lands west of Highway 501 in Los Alamos County, New Mexico, between Pajarito Canyon, Cañon de Valle, and Water Canyon. The proposed trench locations are in the same local area where geologic investigations of a similar nature were conducted in the summer of 1998 (LANL 2016).

LANL is a multidisciplinary, multipurpose research institution owned and managed by the DOE, National Nuclear Security Administration[1] (NNSA), Los Alamos Field Office, in north□central New Mexico. Per DOE orders and standards, DOE obligates its facilities to understand their seismic hazard, calculated ground motion from a seismic event, and facilities' positions relative to known faults (DOE 2016). Therefore, LANL evaluates and updates probabilistic seismic hazard analyses[2] for existing and planned facilities as necessary to meet DOE facility design criteria identified in DOE Standard 1020 (DOE 2016).

LANL's mission and its geologic setting requires reexamination and recalculation of its probabilistic seismic hazard every ten years. The foundation of seismic hazard calculation is the acquisition of field data to reduce uncertainties in the probabilistic analyses. LANL is located adjacent to and within the Espanola Basin of the Rio Grande rift in northern New Mexico. The active western margin of the rift near LANL and Los Alamos is the Pajarito fault system. LANL's first seismic hazard analysis was published in 1995; an update was published in 2007 following the acquisition of additional field geologic data, including information from past paleoseismic trenching efforts.

Previous geologic trenching investigations along segments of the Pajarito fault system were conducted more than 15 years ago and the existing data have high uncertainty in terms of their ability to identify and constrain individual Holocene earthquakes (LANL 2016). The geologic techniques and tools used in the 1990's for geologic age dating on the Pajarito fault system paleoseismic trenches have advanced significantly in the last 15 years. Conducting new trenching investigations using updated techniques would better constrain the number, timing, and magnitude of Holocene paleoearthquakes on the Pajarito fault system, thus reducing uncertainties in LANL's current hazard calculations.

[1] The National Nuclear Security Administration is a semiautonomous agency within DOE.

[2] Probabilistic seismic hazard analysis (PSHA) is a methodology that estimates the likelihood that various levels of earthquake-caused ground motions will be exceeded at a given location in a given future time period. The results of such an analysis are expressed as estimated probabilities per year or estimated annual frequencies

A Biological Assessment (BA) was compiled for Threatened and Endangered Species (T&E) in the area. The BA concluded that there could be a "take" for the Jemez Mountain Salamander. This potential effect on a T&E species dictated that an environmental assessment (EA) was required to further determine if these potential effects might be significant. Consultation with Fish and Wildlife ensued and a Biological Opinion was issued. The Department of Energy (DOE) took the lead in preparing and writing the EA with consultation and input from Santa Fe National Forest staff.

The purpose and need for the project is to authorize the Los Alamos National Laboratory staff, under the authority of DOE, to conduct paleoseismic research to help assess potential for future seismic events in the area to meet DOE facility design criteria.

Decision

Based upon my review of the analysis in the EA, I have decided to implement the proposed actions as follows:

- Permit an access route from Highway 501 to the trench sites between Pajarito Canyon and Canyon de Valle which will require some earthwork on the east facing slope above the highway. (Appendix B)
- Permit two access routes from Highway 501 to the bench sites south of Water Canyon. (Appendix B)
- Permit up to eight trenches a maximum of 8 trenches excavated, approximately 6-9 feet wide, 6-12 feet deep, and 330 yards long. There would be a minimum of 2 trenches at each site. Trenches would be open for about 8 weeks, allowing scientists to interpret and record data.

Mitigations

Due to the project occurring in T&E habitat (Jemez Mountain Salamander), extensive mitigations are required as per the consultation with Fish and Wildlife Service. Additional cultural mitigations were added by request from the Santa Clara Pueblo. See proposed mitigations in Appendix A.

Other Alternatives Considered

In addition to the selected alternative, I considered a no action alternative. The No Action Alternative provides a baseline from which to compare the effects of the action alternatives. Under the No Action Alternative, there would be no trenching and no further study of the paleoseismic phenomenon that would be evaluated in the selected open trenches. The DOE would not be able to use this means to meet their facility design criteria for evaluating potential, future seismic events.

Public Involvement

The Proposed Action for permitting the *DOE/LANL Paleoseismic Trenching Project* was listed in the Schedule of Proposed Actions (SOPA) on July 19, 2017. The SOPA is available to the public on the USFS website, located at https://www.fs.usda.gov/project/?project=51678. A description of the Proposed Action was listed on the USFS public NEPA website with a copy of the scoping letter that was sent out on July 20, 2017. The scoping period was from July 20 to August 25, 2017.

No comments were received from the public. This Preliminary EA was available for a 30 day scoping period from February 16 to March 18 in compliance with 36 CFR 218. The availability of the EA for review was advertised in the Albuquerque Journal. A hardcopy of the EA was made available at the USFS Española Ranger District Office, 1710 N Riverside Drive, Española, NM 87532. After this public review, the Final EA and draft decision documents, including any public comments, were posted on the SOPA and SFNF websites.

In addition to the public scoping, potentially affected tribal governments were notified about the proposed project on July 14, 2017 with comments requested by August 18, 2017. Tribal governments that were sent letters were Kewa Pueblo, Ohkay Owingeh, Pueblo de Cochiti, Pueblo de San Ildefonso, Pueblo of Jemez, Pueblo of Nambé, Pueblo of Tesuque and Santa Clara Pueblo. The second round of tribal letters was sent with the Environmental Assessment for comment on February 12, 2018. One comment letter was received from the Santa Clara Pueblo on March 12, 2018 with concern on potential subsurface artifacts and specific vegetation. Mitigations were adjusted accordingly in the proposed action of the Environmental Assessment.

The Objection Period extended from March 23 to May 7, 2018. No objections were received.

Finding of No Significant Impact (FONSI)

After considering the context and intensity of the environmental effects described in the EA, I have determined that the selected alternative will not have a significant effect on the quality of the human environment as defined in the Council on Environmental Quality implementing regulations at 40 CFR 1508.27. Therefore, an environmental impact statement will not be prepared. I base my finding on the following:

Context: The action is a site-specific action that by itself does not have international, national, region wide or statewide importance. Effects are limited to the locale of project area.

Intensity: The following discussion is organized around the ten significance criteria described in the National Environmental Policy Act (NEPA) regulations at 40 CFR 1508.27.

1) **Impacts may be both beneficial and adverse. A significant effect may exist even if the Federal agency believes that on the balance the effects will be beneficial.**

   Both beneficial and adverse impacts were considered in the analysis (EA, Section 3, pp. 10-23). Adverse effects have been reduced or eliminated through project design and mitigation measures as described in this decision. The project is expected to have beneficial effects to public health and safety by gathering data pertinent to potential future seismic activity in the area.

2) **The degree to which the proposed action affects public health or safety.**

   No significant adverse effects on public health and safety were identified. The area of trenching would not affect public health and safety since the trenches are in an area not normally frequented by the public.

3) Unique characteristics of the geographic area such as proximity to historic or cultural resources, park lands, prime farmlands, wetlands, wild and scenic rivers, or ecologically critical areas.

The project will not adversely affect parks, prime farm lands, wild and scenic rivers, or other resources considered to have unique characteristics. None of these features are found in the project area.

4) The degree to which the effects on the quality of the human environment are likely to be highly controversial.

The effects on the quality of the human environment are not likely to be highly controversial. The environmental analysis has documented the expected environmental effects of the proposed action. These effects have been disclosed in section 3 of the EA. The analysis represents the judgment and expertise of resource management professionals who have applied their knowledge to similar projects and resources in the past. The EA and record demonstrate the team's consideration of the best available science in analyzing the environmental effects.

5) The degree to which the possible effects on the human environment are highly uncertain or involve unique or unknown risks.

The effects analysis (EA pp. 16-25) indicates the effects are not uncertain, and do not involve unique or unknown risk. The Forest Service has considerable experience with the types of activities to be implemented. The effects described in the EA are based on the judgment of experienced resource management professionals using the best available information.

6) The degree to which the action may establish a precedent for future actions with significant effects or represents a decision in principle about a future consideration.

The effects analysis (EA pp. 16-25) indicates the effects are not uncertain, and do not involve unique or unknown risk. The Forest Service has considerable experience with the types of activities to be implemented. The effects described in the EA are based on the judgment of experienced resource management professionals using the best available information.

7) Whether the action is related to other actions with individually insignificant but cumulatively significant impacts.

The decision to permit the access and trenching activities would not establish any precedent for future actions with significant effects, or represent a decision in principle about a future consideration.

8) The degree to which the action may adversely affect districts, sites, highways, structures, or objects listed in the National Register of Historic Places or may cause loss or destruction of significant cultural or historical resources.

The cumulative impacts of the action on geology and soils, recreation, Wildlife and T&E

Species, and noxious weeds were considered and disclosed in the EA (pp 25-26). The direct and indirect effects of the proposal are expected to be minor in the short term and neutral over the long term. No past or future actions have been identified that will combine with the effects of the proposed action to cause cumulatively significant effects.

9) **The degree to which the action may adversely affect an endangered or threatened species or its habitat that has been determined to be critical under the Endangered Species Act.**

The action will have no significant adverse effect on districts, sites, highways, structures, or objects listed in or eligible for listing in the National Register of Historic Places. The action will also not cause loss or destruction of significant scientific, cultural, or historical resources. Formal consultation with the U.S. Fish and Wildlife Service (USFWS) pursuant to Section 7 of the Endangered Species Act was required because the BA identified potential take of the Jemez Mountain Salamander and the project is within critical habitat for this listed species. The BO and EA concluded that the LANL paleoseismic trenching project, as proposed, is not likely to jeopardize the continued existence of the Jemez Mountains salamander, and is not likely to destroy or adversely modify designated critical habitat.

10) **Whether the action threatens a violation of Federal, State, or local law or requirements imposed for the protection of the environment.**

The selected alternative is in full compliance with all federal, state and local law requirements imposed for environmental protection.

Findings Related to Other Laws

National Forest Management Act: The Santa Fe National Forest Plan was adopted on July 1987 and has been amended several times. The project area is located in Management Area C (EA p.5). I find that this proposal is in accordance with the Forest Plan, which implements National Forest Management Act.

Endangered Species Act: Formal consultation with the U.S. Fish and Wildlife Service (USFWS) pursuant to Section 7 of the Endangered Species Act was required. The BO stated: "After reviewing the current status of the Jemez Mountains salamander, the environmental baseline for the action area, the effects of the proposed action and the cumulative effects, it is the Service's biological opinion that the LANL paleoseismic trenching project, as proposed, is not likely to jeopardize the continued existence of the Jemez Mountains salamander, and is not likely to destroy or adversely modify designated critical habitat. We base our conclusion on the following:

1. LANL has identified suitable conservation measures that will be incorporated into the proposed action, which will reduce impacts to the Jemez Mountains salamander and its designated critical habitat, as well as manage for the recovery of Jemez Mountains salamanders on the Santa Fe National Forest.

2. Activities in salamander critical habitat will occur outside of the surface active season of the

salamander (June 15 through October 30), or will incorporate measures to avoid impacting the species, unless otherwise agreed upon and documented between LANL and USFWS.

The conclusions of this biological opinion are based on full implementation of the project as described in the Description of the Proposed Action section of this document, including any Conservation Measures that were incorporated into the project design.

National Historic Preservation Act: A Heritage Resource Investigation was conducted in the proposed project area and access corridors. The project complies with the provisions of the National Historic Preservation Act of 1966, as amended, with Executive Order 11593, 36 CFR 800 regulations, the Region 3 Programmatic Agreement and direction in FSM 2360.

Administrative Review and Objection Rights

The Paleoseismic trenching project is an activity implementing a land management plan and not authorized under the Healthy Forest Restoration Act (HFRA) and is subject to the Pre-decisional Administrative Review Process (Objection Process) pursuant to 36 CFR 218, subparts A and B. This period has passed.

Implementation

No objections were filed within the 45-day time period. Therefore implementation of the decision may occur on, but not before, the fifth business day following the end of the objection filing period.

Signature and Date

Sanford Holtzlocker

District Ranger

Española Ranger District

Santa Fe National Forest

15 May 18

DATE

Appendix A—Mitigation Measures

The following would be included in the proposed action in compliance with the Biological Opinion and as requirements in the SFNF special use permit.

Mexican Spotted Owl:

A. Follow all requirements in the SFNF special use permit.
B. Project activities would not cut down trees and shrubs from March through August of any year (the peak bird-nesting season) to ensure bird nestlings and eggs protected under the Migratory Bird Treaty Act are not destroyed.
C. No trees, alive or dead, larger than 18 inches (in.) (46 cm) in DBH (diameter at breast height) are to be removed.
D. Downed logs larger than 18 in. (46 cm) in diameter are to be retained when possible.
E. Restoration vegetation planted in association with the construction of these projects must be native species appropriate for this elevation and forest type.

Jemez Mountains salamander:

A. A new survey of LANL's western boundary with the SFNF will be pursued to determine a clear boundary line.
B. The new segment of road will be designed to be as short as possible while still maintaining minimum safety requirements for grade and slope appropriate to the vehicles planned to be used.
C. Where the roadbed still exists, all logs and rocks removed will be pushed to the side in a way to create future salamander refugia.
D. No road work will occur during wet conditions when salamanders move above ground or during storm events (July-September).
E. Road improvements will be designed to have the least amount of ground disturbance as possible and will not exceed a single bladed lane.
F. All equipment access routes must skirt and avoid all standing trees. Potential safety trees will be considered on a case-by-case basis.
G. Permitted biologists will be present during road work to identify potential salamander refugia that would require a pause in road clearing until adequate surveys of the immediate area were completed.
H. Coordination with Service staff will occur at all times during the project.
I. Service staff will observe project activities as frequently as needed or requested.
J. Areas of disturbance will be restored with native plants appropriate to the local mixed conifer habitat-type.
K. Because disease is a primary threat to the Jemez Mountains salamander and the chytrid amphibian pathogenic fungus *Batrachochytrium dendrobatidis* (Bd) has been found in a wild-caught Jemez Mountains salamander in 2003 and identified in other amphibians around the Jemez Mountains (LANL 2016). In consideration of these factors, prior to field activities, a fungal disinfection plan will be in place. The plan will address requirements to aide in preventing the introduction or spread of the fungus. Plan requirements would include the application of disinfectant to all field tools, machinery, vehicles, and work boots before entry, between separate sites, and after exiting the field. Decontamination will occur prior to entry

and exit from the trenching sites. All project personnel and all field equipment used within designated critical habitat will be required to follow the disinfectant protocol standards set to ensure Bd is not transported between sites.

L. Excavated material will be placed on tarps adjacent to the trenches when feasible. This would ensure that interstitial spaces used by salamanders to reach subterranean habitat would be preserved.

M. A graduate research project will be initiated at LANL to determine if and how the geology of the Jemez Mountains and the Pajarito fault system influence Jemez Mountains salamander distribution. This area of research is lacking for this species and could result in significant contributions to the understanding of the species, which could ultimately influence its management.

N. Other areas that could be affected by the Proposed Action to ascertain take of Jemez Mountains salamanders and/or loss of its habitat that causes harm or harassment to the species. This monitoring is to be accomplished using protocol established in cooperation with the USFWS prior to the implementation of the Proposed Action

O. Activities in salamander critical habitat would occur outside of the surface-active season of the Jemez Mountains salamander (June 15 through October 30) or would incorporate measures to avoid impacting the species (USFWS 2017), unless otherwise agreed upon and documented between LANL and USFWS.

P. LANL is to submit annual monitoring reports to the USFWS New Mexico Ecological Services Field Office within 90 days of the completed Proposed Action or no later than December 31, 2017. The first report was submitted to and accepted by the USFWS on November 20, 2017. An additional report would be submitted by LANL either at the conclusion of the project or end of year 2018 (LANL 2017). These reports are to briefly document the effectiveness of the term and condition and locations of Jemez Mountains salamander(s) observed, and, if any are found dead, the suspected cause of mortality.

Additional mitigation measures include:

A. Compliance with the Migratory Bird Treaty Act requires that no vegetation removal occurs during the peak bird breeding season, May 15 through July 31, unless a biologist has conducted a nest check to ensure that there are no nesting birds present. If active nests are found, the nest tree or bush would be left until the nesting is complete.

B. Re-contouring and reseeding of construction scarred pathways and trench site locations.

C. Protection of the public during the project would entail fenced off trenched areas using portable temporary metal fencing 60 inches tall with locking gates and several signs, both on fences and at the entrance to the site.

D. For protection of the local fauna, at least one end of every trench would be ramped so that wildlife, should they get in the trench, have an escape route.

Mitigations for Cultural Resources:

A. A LANL Archaeologist will be on site to monitor all ground disturbance for both site access and trench excavation. Santa Clara Pueblo will be notified when this work will begin.

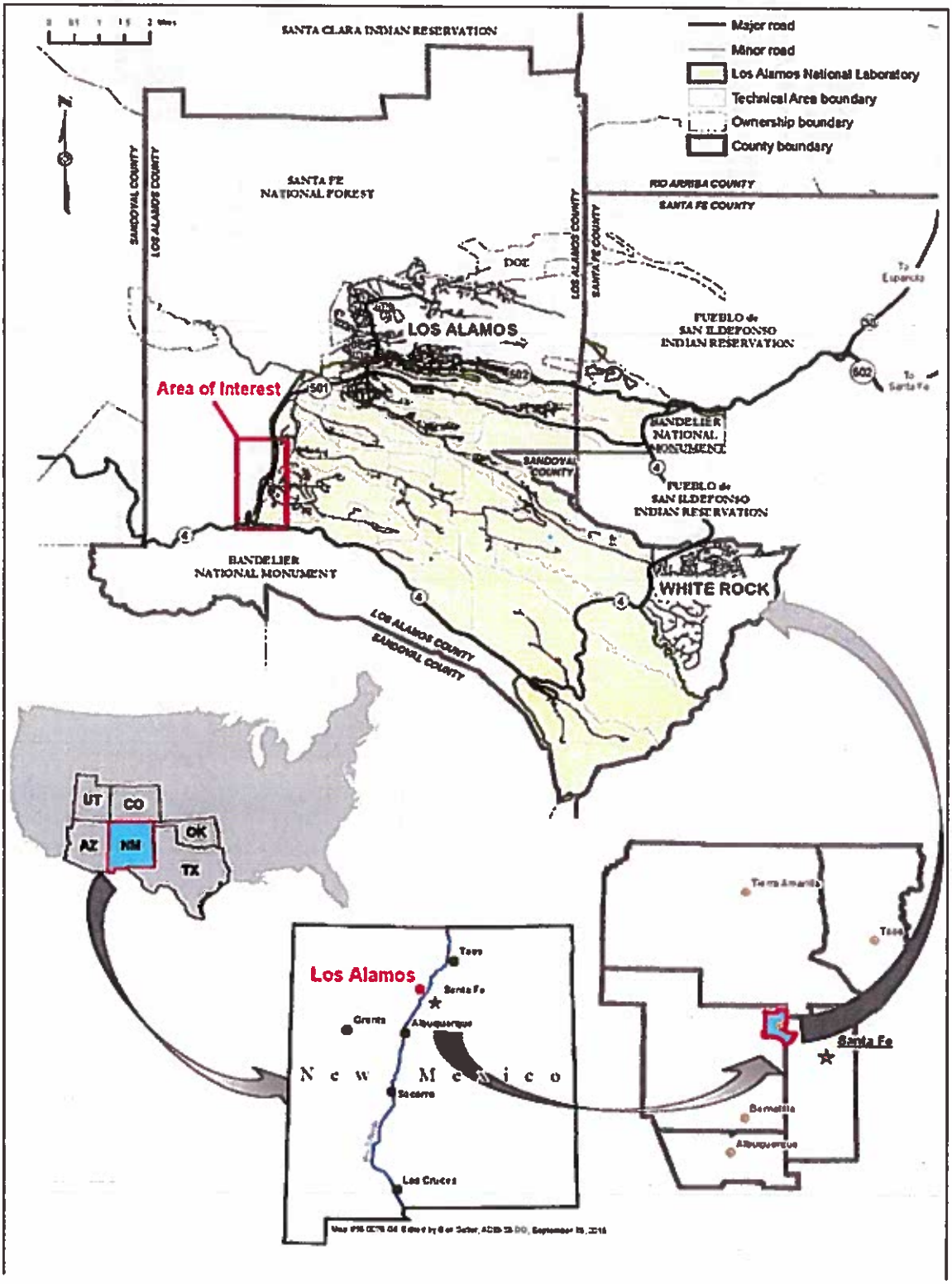
B. Should any of the following plants be located in the disturbance path, they should be avoided: yarrow, goldenrod, osha, Douglas fir, ponderosa pine, and broom reed grass.

Reasons for the Decision

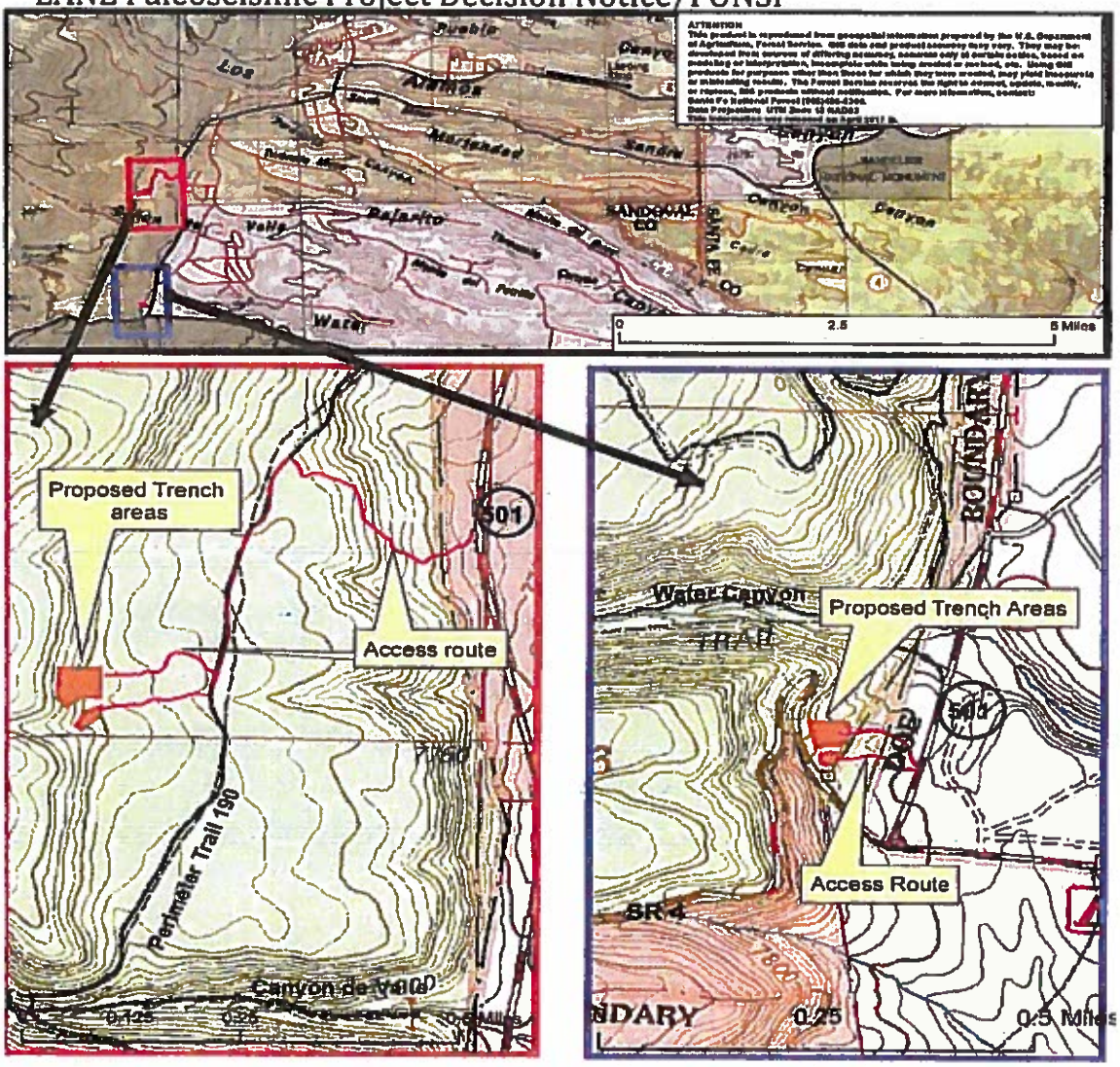
The selected alternative best meets the project purpose and need and achieves desired conditions in the following ways:

- The selected alternative provides for continued study of prediction of area seismic events to safeguard LANL/DOE facilities and public safety.

Appendix B—Project Area Map



General Location of project area



Espanola Ranger District
Santa Fe National Forest

LANL Paleoseismic Research Project

FINDING OF NO SIGNIFICANT IMPACT

For the

ENVIRONMENTAL ASSESSMENT LOS ALAMOS NATIONAL LABORATORY PALEOSEISMIC RESEARCH PROPOSAL SPECIAL USE PERMIT

RESPONSIBLE AGENCY: U.S. Department of Energy

ACTION: Adoption of Environmental Assessment and Issuance of Finding of No Significant Impact

SUMMARY:

Los Alamos National Laboratory (LANL) located in north-central New Mexico is a multidisciplinary, multipurpose research institution owned and managed by the United States Department of Energy's (DOE) National Nuclear Security Administration (NNSA), Los Alamos Field Office. Per DOE orders and standards, DOE obligates its facilities to understand their seismic hazard, calculated ground motion from a seismic event, and facilities' positions relative to known faults. Therefore, LANL evaluates and updates probabilistic seismic hazard analyses[1] for existing and planned facilities as necessary to meet DOE facility design criteria identified in DOE Standard 1020.

The United States Department of Agriculture Forest Service's Española Ranger District within the Santa Fe National Forest (SFNF) has prepared an *Environmental Assessment Los Alamos National Laboratory Paleoseismic Research Proposal Special Use Permit* (EA) and subsequent *Decision Notice and Finding on No Significant Impact* for an application for a special use permit to conduct a geologic investigation submitted by the DOE on behalf of LANL, titled *DOE/LANL Paleoseismic Trenching Project*. NNSA has adopted the EA after independently reviewing the Española Ranger District's final EA.

Purpose and Need: Authorization for the LANL staff, under the authority of DOE, to conduct paleoseismic research to help assess potential for future seismic events in the area to meet DOE facility design criteria. Previous geologic trenching investigations along segments of the Pajarito fault system were conducted more than 15 years ago and the existing data have high uncertainty in terms of their ability to identify and constrain individual Holocene earthquakes. The geologic techniques and tools used in the 1990's for geologic age dating on the Pajarito fault system paleoseismic trenches have advanced significantly in the last 15 years. Conducting new trenching investigations using updated techniques would better constrain the number, timing, and magnitude of Holocene paleoearthquakes on the Pajarito fault system, thus reducing uncertainties in LANL's

[1] Probabilistic seismic hazard analysis (PSHA) is a methodology that estimates the likelihood that various levels of earthquake-caused ground motions will be exceeded at a given location in a given future time period. The results of such an analysis are expressed as estimated probabilities per year or estimated annual frequencies.

current hazard calculations.

Proposed Action: The project will permit:

- An access route from Highway 501 to the trench sites between Pajarito Canyon and Canyon de Valle which will require some earthwork on the east facing slope above the highway.
- Two access routes from Highway 501 to the bench sites south of Water Canyon.
- Excavation of up to eight trenches approximately 6-9 feet wide, 6-12 feet deep, and 330 yards long. There would be a minimum of 2 trenches at each site. Trenches would be open for about 8 weeks, allowing scientists to interpret and record data.

No Action Alternative: The No Action Alternative provides a baseline from which to compare the effects of the action alternatives. Under the No Action Alternative, there would be no trenching and no further study of the paleoseismic phenomenon that would be evaluated in the selected open trenches. The DOE would not be able to use this means to meet their facility design criteria for evaluating potential, future seismic events.

EA REVIEW AND COMMENT:

The Proposed Action for permitting the DOE/LANL Paleoseismic Trenching Project was listed in the USFS Schedule of Proposed Actions (SOPA) on July 19, 2017. The SOPA is available to the public on the USFS website, located at https://www.fs.usda.gov/project/?project=51678. A description of the Proposed Action was listed on the USFS public NEPA website with a copy of the scoping letter that was sent out on July 20, 2017. The scoping period was from July 20 to August 25, 2017.

No comments were received from the public. This Preliminary EA was available for a 30 day scoping period from February 16 to March 18 in compliance with 36 CFR 218. The availability of the EA for review was advertised in the Albuquerque Journal. A hardcopy of the EA was made available at the USFS Española Ranger District Office, 1710 N Riverside Drive, Española, NM 87532. After this public review, the Final EA and draft decision documents were posted on the SOPA and SFNF websites.

In addition to the public scoping, potentially affected tribal governments were notified about the proposed project on July 14, 2017 with comments requested by August 18, 2017. Tribal governments that were sent letters were Kewa Pueblo, Ohkay Owingeh Pueblo, Pueblo de Cochiti, Pueblo de San Ildefonso, Pueblo of Jemez, Pueblo of Nambé, Pueblo of Tesuque and Santa Clara Pueblo. The second round of tribal letters were sent with the EA for comment on February 12, 2018. One comment letter was received from the Santa Clara Pueblo on March 12, 2018 with concern on potential subsurface artifacts and specific vegetation. Mitigations were adjusted accordingly in the EA's proposed action.

AGENCY CONSULTATION: Formal consultation with the U.S. Fish and Wildlife Service (Service) pursuant to Section 7 of the Endangered Species Act was required. The Service's Biological Opinion stated: "After reviewing the current status of the Jemez Mountains salamander, the environmental baseline for the action area, the effects of the proposed action and the cumulative effects, it is the Service's biological opinion that the LANL paleoseismic trenching project, as

proposed, is not likely to jeopardize the continued existence of the Jemez Mountains salamander, and is not likely to destroy or adversely modify designated critical habitat. The Service's conclusion is predicated on the full implementation of the project as described in the EA and incorporation of all stated mitigation measures.

DETERMINATION: NNSA has independently reviewed the Española Ranger District's final EA and determined that the analysis meets President's Council on Environmental Quality and DOE NEPA regulations and adequately assesses and discloses the environmental impacts of the Proposed Action and No Action Alternatives. Based on the NNSA's independent evaluation, the Final EA is hereby adopted.

Based on the evaluation presented in the final EA, DOE has determined there would be no significant impact from proceeding with the Proposed Action. The basis of this determination, provided all specified mitigations are implemented, is that there are no adverse direct, indirect, or cumulative environmental effects that would likely result from the Proposed Action based on the analysis of relevant issues of environmental concern in the EA and the implementation of mitigation actions.

The DOE therefore approves this Finding of No Significant Impact with mitigation measures pursuant to the *National Environmental Policy Act* of 1969 (42 U.S.C. 4321 et seq.), the Council on Environmental Quality Regulations for Implementing the Procedural Provisions of NEPA (40 CFR 1500), and DOE NEPA Implementing Procedures (10 CFR 1021). No Environmental Impact Statement is required for this proposal.

FOR FURTHER INFORMATION CONTACT: For further information on this EA, contact Ms. Kristen Dors, NEPA Program Manager, U.S. Department of Energy, National Nuclear Security Administration, Los Alamos Field Office (NA-LA), 3747 W. Jemez Road, Los Alamos, NM 87544 or via email at NA-LA_NCO@nnsa.doe.gov.

For further information on the DOE NEPA process contact the Office of NEPA Policy and Compliance (GC-54), U.S. Department of Energy, 100 Independence Avenue, SW, Washington DC 20585; telephone (202) 586-4600 or (800) 472-2756.

Date 5-17-18

William S. Goodrum
Los Alamos Field Office Manager